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The Massachusetts Medical Society.

MEETING OF THE SECTION OF SURGERY, JUNE 3, 1919.

TREATMENT OF INFECTED BONE WOUNDS.

BY FREDERIC J. COTTON, M.D., BOSTON.

Of all the work of the reconstruction hospitals in the last year I have chosen to speak of the treatment of the septic bone conditions. First, because it has been, at its best, so good; second, because it is so eminently *the* contribution of military surgery in a field in which our civil practice has signally failed in the past; third, because there is danger that the successful methods evolved may not be applied to civil practice.

This is because part of the success obtained depends on active antisepsis in infected wounds—which in practice, so far, means a great deal of reliance on the Dakin solution and the Carrel technique.

Now, there are many leading surgeons who are necessarily no younger than is convenient. Otherwise they would not be leaders. They have been for years past accustomed to snort violently at any statement of the efficiency of antiseptics in wounds and this sort of thing be-

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comes a reflex action very hard to correct, save in the young, even in the face of evidence.

We have often heard, are due to hear from many men again and again in the coming year, that the Carrel-Dakin treatment is no good. Mostly these are men who never really tried it or saw it tried under favorable conditions.

I admit that a mere knowledge of the Carrel-Dakin technique does not qualify a man to treat wounds, but I submit that only *with* this resource at hand, plus expert surgery, plus common-sense, plus organized industry, can one hope for results such as have been obtained in the most competent clinics in this war.

Remember that few hospitals overseas, outside Compiègne and DePage's clinics, have seriously attempted to deal with infections in this way.

This is no one's fault, but a necessary corollary of war conditions—but it does throw us back on our army hospitals on this side for the useful material to judge from.

I am going to try, therefore, to give you as good a notion of what has been done in this line in your own New England Hospital as I can contrive in a few minutes.

As you all know, the hospital, now known as U. S. Army General Hospital No. 10, is the outgrowth of the original idea of reconstruction



CASE 1.—On entry.



CASE 1.—After three months.

service first formulated here in Boston two years ago, and from the start it has been planned for reconstruction work, built for it, and equipped for it rather better than a good many such places. Moreover, I had expected to have just the sort of work that came, and the surgical division was very good to me in the matter of surgeons—as to quality.

Consequently, when it came to assignments, and when I put not my weakest but my ablest assistants on the septic end of the job, the pick was an unusually good team. This counts.

The head of the team was a young surgeon of good training and experience before the war, and had the advantage of the training of the Rockefeller War Hospital in the Carrel-Dakin technic. Next came an orthopedist, also with special training, adept at the handling of mechanical apparatus, so important to these cases. Then three picked young overseas men of experience.

Picked nurses and orderlies and a real chemist in the pharmacy completed the team.

The septic ward held 50 patients at first, now 110 beds, with 40 to 75 patients under wound disinfection at one time.

As should be the case in all hospitals, the septic side was kept absolutely separate—its own crew—its own operating room, operating kits, etc.

This had one drawback, from my point of view. Bussed with clean operating, I felt justified in operating on the septic side only in the grave cases or for special reasons, though, as a matter of fact, these modern septic wards are so free of pus as to be almost safe.

Now a word as to figures. Three hundred and forty-six cases have been admitted. One hundred and eighty-two operations have been performed. There has been one death,—an empyema, who came in *in extremis* and died before he could be operated on.



CASE 1.—After three months.



CASE 2.—Nov. 20, 1918.



CASE 2.—Dec. 18, 1918.



CASE 2.—May 4, 1919.



Case 2.—After six months.

There have been two amputations, one for a hopelessly crushed and stripped leg with a septic knee, one deliberately after the wounds had been healed, for a limb so badly damaged and paralyzed as to be worthless. There have been no reamputations. There have been no resections.

Except as noted, and for the cases now under treatment, all the 346 cases have been sent out of the ward healed and there have been only half a dozen cases returned, none of them for anything more serious than a few days' cleaning up. There have been no cases of sec-

ondary osteomyelitis after the cleaning operation.

None of the cases under treatment is doing badly,—most of them doing admirably well.

Save for a few cases of post-operative sepsis and slough, due to accidents with latent sepsis in g.s.w. scars, the cases have practically all been wounds received between July 18 and November 11, 1918. They have been all sorts. Perhaps the pictures will give an idea of the sort of thing dealt with and the routine of results.

The case here shown (Case I) wounded October 3, 1918, went through seven transfers be-



CASE 3.—April 2, 1919.



CASE 3.—April 21, 1919. With plate in place. Carrel-Dakin tubes also well shown.



CASE 3.—May 3, 1919. Plate out, consolidation beginning.

fore we got him, February 15, 1919. He had had Dakin treatment, but on arrival was in poor general condition with active sepsis. Six days later I did an extensive operation with removal of a lot of sequestra and the Carrel-Dakin treatment was begun. At two weeks the wound was clinically clean.

On April 3, at 40 days, the bacterial count was down to one per field. April 17, a little less than eight weeks, the wound was solidly healed.

(X-Ray February 17, May 10, 1919; picture May, 1919.)

The next case (Case II), shot on guard duty, June 30, lay in a civil hospital, with a septic femur fracture, till November. When we got him he had great deformity and shortening, and severe local sepsis, and was in desperate general condition.

November 26, 1918, very extensive sequestra were removed and a very radical clean-up done. Owing to bleeding, the Dakin treatment was not used for a fortnight, and sepsis continued with slow improvement. On January 26, 1919,

the wound was reopened and the Dakin solution properly handled. The tubes came out early in March, and March 24 he was healed and solid.

(X-Rays November 20, December 18, May 4. Photo May, 1919.)

The next case (Case III) similar, was one of the lost battalion, shot October 7, untreated for 36 hours. We got him February 5, with a very septic compound fracture, heavy overlapping, many pus pockets, and in poor shape generally. Sequestra removed February 14, and a quick clean up under Carrel-Dakin. April 8, operation to correct deformity,—bones levered into place and held to a new type of plate. Plate cut at three weeks. Wound now small and closing rapidly. No bare bone.

(X-Rays April 2, 21, May 3, 1919.)

Case IV, compound fracture of hip, dating from October 6. Eight transfers before we got him, February 5. In bad condition, local and general; unusually anemic.

First operation a week after entrance. Sequestra removed from a huge cavity in and be-



CASE 4.—Feb. 6, 1919.



CASE 4.—May 3, 1919.

hind the femoral neck. There was, however, bony union. March 13, 1919, cavity closing reopened, simply to carry out Dakin treatment better. May 8, less than three months after the first clean up, the wound was closed, and is still closed.



CASE 4.—May, 1919.

(X-Ray February 6, May 7, 1919. Photo May, extension flexion.)

The next man, Case V, had been shot in August, received January 28. Had a solid union of the femur, but a sinus, and also involvement of the external popliteal nerve and toe drop. February 7 a sequestrum was removed with considerable debris, partly shrapnel fragments. Under Carrel-Dakin treatment he cleaned up so fast that the tube was out at three weeks and the wound solidly healed in less than seven weeks. The paralysis, as so often happens even in these late cases, recovered spontaneously.

(X-Ray February 5, May 8.)

Case VI was shot November 5, reached us February 25 with his femur fracture united but with sinuses open on both sides of the thigh. Many and sizeable sequestra removed March 3, tubes out April 16. All wounds soundly healed on May 24.

(X-Ray February 27, May 2. Photo May.)

The next (Case VII) had 5 cm. of the tibia gone, gone since October 4. Operated on February 15. After five sequestra came out there was at the back little but a periosteal layer for two inches. Now shows a very small closing



CASE 5.—Feb. 6, 1919.



CASE 5.—May 8, 1919.

wound, no bare bone and union progressing at a great rate. Clinically, it is already pretty solid, and apparently is going to need no graft. It is three and one-half months since operation.

(X-Ray February 7, May 7, 1919.)

The next (Case VIII) is interesting as showing the clean-up of the secondary atrophic picture as sepsis is gotten rid of. He was wounded by high explosive September 5, admitted here February 20, had a large debris-filled bone cavity cleaned out March 10, and was all healed April 21, less than six weeks.

(X-Ray February 25, May 7, 1919.)

Case IX came in with osteomyelitis sinuses at both ends of the fibula, came in March 7, just four months after he was hit. Operation showed sequestra at the lower end, but elsewhere only subperiosteal pockets with a few scale sequestra along a hugely thickened fibula. This was simple, the tubes were out and the wound showed only flat granulations in a month, though it took another six weeks to skin over.

This wound (Case X) received in July, tore out the whole inner tibial head. He entered in December with a wide gaping wound and open joint. Under Carrel-Dakin treatment it

healed in, but only after four and one-half months.

Some of our cases were not handled by the Carrel-Dakin technic but on the basis of a practice I have used for years,—sterilization by 95% carbolic, alcohol, and bone wax plugging. This has its place in cases in which the cavity is well defined and can be cleaned to a firm wall and properly sterilized. In fracture cases it is not to be used unless firm and sufficient union is present. Bone grows faster under Dakin solution. But when it is indicated this is a very neat method and usually works, the wax being extruded slowly leaving the clean osteoid tissue behind it.

My associates cared little for this scheme at first, but now seem partly converted, partly owing to the enormous saving in labor to the surgeon and comfort to the patient if it works. It needs a bit of judgment and good technique.

This case (Case XI) was so handled. Shot July 19; compound fracture tibia reached us in December. Operated December 30, very extensive cleaning of small sequestra and much debris out of a cavity that took two bottles of the army bone wax—well over two ounces.



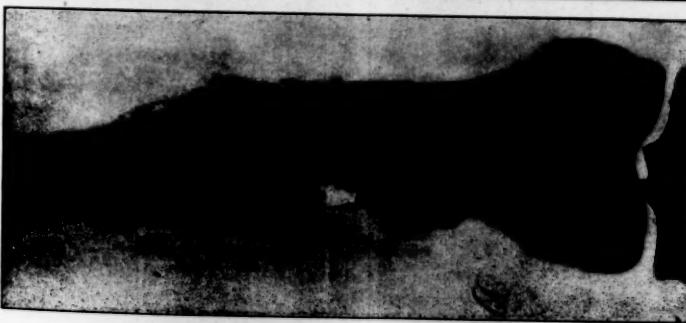
CASE 6.—May 2, 1919. Side view.



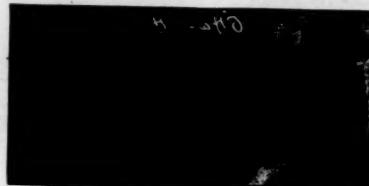
CASE 6.—Feb. 27, 1919. Side view.



CASE 6.—May 2, 1919. Front view.



CASE 6.—Feb. 27, 1919. Front view.



CASE 6.—May, 1919.



CASE 7.—Feb. 7, 1919.



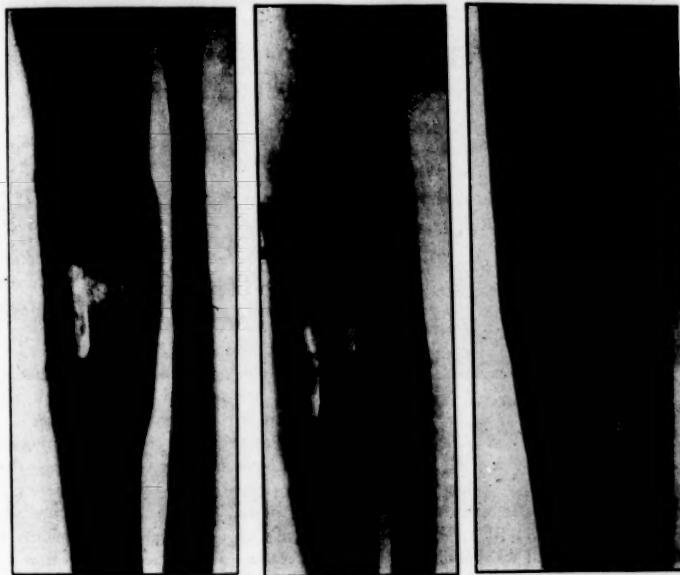
CASE 7.—May 7, 1919.



CASE 8.—Feb. 25, 1919.



CASE 8.—May 7, 1919. Note the disappearance of the secondary absorption changes in three months.



CASE 11.—Dec. 2, 1918. Before treatment. CASE 11.—Feb. 11, 1919. After sterilization and wax plug. CASE 11.—May 7, 1919. After healing.

Never had any more sepsis, up and about within a short time. Last of wax out at nine weeks and firm closure in four months.

(X-Rays December 2, 1918; February 11, 1919. Photo in May.)

This shoulder wound (Case XII) was similarly disinfected after removing a sequestrum, and then filled with bismuth paste. This came out in a month. Then ambulatory Dakin treatment; healed in a month more.

(Photo afterward, May, 1919.)

The next (Case XIII) was much the same. Wounded in the Argonne in September, came here in February, after a run of gangrene and sepsis. Sequestra removed from tibia, cavity cleaned and disinfected, filled with bone wax. Has gone on to full healing in three and a half months with the wax now all out.

(X-Rays February 12, March 18, April 4, 1919.)

Case XIV, old compound fracture of both legs was treated in the same way



CASE 11.—May, 1919. After healing.



CASE 12.—In May. After healing.

on both sides. On one side the wax came out after a week and it was then treated by Carrel-Dakin and nearly healed at six weeks. On the other side the wax stayed, as it should, for three weeks (this is right for a small cavity) and the wound was solidly healed at six weeks.

Case XV, a like case, was healed a bit dif-

ferently. The usual operation first, then Carrel-Dakin for a month until clean, then Bismuth paste, and later a paraffin and sesame mixture to fill the cavity. Solidly healed at four months.

(X-Rays January 21, May 7, 1919.)

This last is a technique that takes the place of the often impracticable secondary closure. It is apparently ours, and seems to have a place, —again not without calling for clinical judgment.

Case XVI was handled in the same way,—cleaned out, cleaned up with Carrel-Dakin, filled with wax, after a month when the cavity was sterile, now solidly healed over, but only at three and a half months after operation.

(X-Rays January 21, May 7, 1919.)

This is slow, but these patients during this treatment are up and about without pain or sepsis, and with infrequent dressings.

We think this wax treatment purely protective, and have used various mixtures,—the government's pure wax, Luken's bone-wax, firm bismuth paste (No. 2) and a mixture of Captain Rice's of equal parts paraffin and oil of sesame. For cases waxed at the time of operation Luken's wax is best, for the later fillings I like Dr. Rice's mixture.



CASE 13.—Feb. 12, 1919.



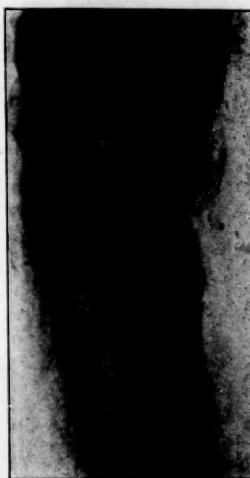
CASE 13.—March 12, 1919.



CASE 13.—April 4, 1919.



CASE 15.—Jan. 21, 1919.



CASE 15.—May 7, 1919.



CASE 16.—Jan. 21, 1919.



CASE 16.—May 7, 1919.



CASE 17.—Gap in bone covered by special technique.



CASE 17.

We believe the value of the method is a matter of protection, first against centripetal infection; second, against chilling and drying; bone so protected, if clean, forms osteoid tissue cleanly and fairly rapidly. The plates that come next illustrate this.

October 3 a young officer (Case XVII) had his leg shattered by high explosive and came to us February 14, with a wide-open wound in his tibia—an open trough out of which protruded spike-like bone ends above and below—behind, there was a bare ribbon of new bone, not continuous at that.

A clean-up operation was done February 25, with carbolic disinfection, after which the whole region was imbedded in a protective mass of

bone wax, under which the gap below and behind the spike ends proliferated up to the level of those ends, which in the meantime grew down closer to one another, remaining clean and healthy. They were then covered in, and are still covered by a two-stage skin and fat graft, and union is progressing under this. I know of no other way in which this could have been done.

(Photo, one x-ray.)

A few isolated points and I shall be through.

First, as to the one special class of cases of which Case XVIII is a specimen: had an in-



CASE 18.

fected bullet wound of the ankle October 26. He came to us just four months later, with an ankylosed joint, much pus, three sinuses. Despite operation and Carrel-Dakin he is not yet soundly closed but has occasional pus, apparently from a remnant of joint cavity. There have been two other cases, now healed, but showing for a long time a like trouble, and evidently we have something to learn about handling this type.

(Photo.)

Next, as to the behavior of grafts under Carrel-Dakin. There have been two cases in which grafts were lost. In one it was a pedicle graft from the tibia nearby; in the other, a free graft was set into the tibia in a case that seemed nearly clean. In both instances the graft seemed to have favored bone growth in the surrounding granulations before it came away, and in one, part of the graft stayed and grew under the conditions of controlled sepsis.

In two cases of bone graft in which there was extensive scarring that sloughed, the Carrel-Dakin treatment controlled the mild sepsis so that the graft stayed clean and was covered in.

In a fourth case of real sepsis (staphylococ-



CASE 19.—Healed in six weeks. Compare, also, Case 12, a like case, healed in six weeks, without secondary suture.

eus) the same happy result was achieved in three weeks.

In a fifth case, non-union of the humerus, operated on four months after healing,—an abscess cavity was found at operation. The prompt resulting sepsis subsided under Carrel-Dakin, and the bone was covered with clean granulations in two weeks.

We have had little experience with flap and transplant work.

One pedieled flap helped, but sloughed in part. One free fat transplant and one pedieled fat-fascia filling were only partly successful. We believe this work can be better done than we have done it.

We have done comparatively few secondary suture operations, partly because we have been bone-waxing some cases, but mainly because we have found that after reaching the point where this procedure comes in question the wounds cicatrize so rapidly under Dakin solution that it is apt not to be worth while to operate.

In this point we have not followed the Rockefeller technique nor have we, in spite of our very radical operating, felt it necessary to open all wounds as wide as they do at the sacrifice of sound tissue.

To close, we believe that routine scientific treatment, as well coördinated as it has been possible to make it at No. 10, brings us to a point where infection in bone can at last be handled with precision and with a practical uniformity of result long desired, but never within our reach before this war.

DISCUSSION.

CAPT. ALLEN G. RICE, Springfield: I might say at the very start that we don't hold that this is the only way to treat these wounds. I think we all feel that it is merely a step towards the final method. It is certainly the best thing we have found yet, and I think it is going to have its place as progress goes on. It is surely going to leave a mark as a step in the final definite technique of the treatment of these bones. It is surely going to leave a mark whether the whole principle is accepted or not, and there are two points which I am sure are going to stay.

The first of these is in regard to the radical surgery which has to be done in these cases. It is not enough just to clean out what is wrong; we have to go way beyond that. The wound has got to be a large trough like a saucer or a basin. You can't have a cavity like a dentist's cavity in a tooth and expect to have it heal under Dakin's solution, because it won't; but if it is big enough it will heal fast.

The next point this method brought out is the absolute necessity of making every dressing of these wounds an aseptic procedure. This can be done very easily. You don't need to wash your hands between dressings. You can go right down the whole ward from one case to another, provided you have enough hemostats, and sterile gauze. Otherwise these wounds will not heal well; you can't get your bacteria count down, and you lose time. These two points are bound to stay whether the rest of the Carrel-Dakin method persists or not.

In these Carrel-Dakin cases there are two very important elements. One is Carrel and one is Dakin. Neither one does the trick; you have to have both. It is a combination treatment. Dakin worked out the solution of a definite strength, but if you don't have that solution made right and kept right you won't get results. On the other hand, if your solution is all right and you don't carry out the Carrel technique you won't get results. As to the solution of hypochlorite of sodium, it has to be made right. It is one man's job to make it for a hospital, and a quantity of 18,000 to 20,000 c.c. a day has to be made, and made right. One test is not enough; there must be more than one. It has to be of a certain strength and also of a certain alkalinity—two entirely different things. You can't test the strength and think the alkalinity is going to be right, and you can't test the alkalinity and take it for granted that the strength will be just right. We were very fortunate in having a first-class pharmacist who made the solution every day, sometimes twice a day, tested it as to its alkalinity and strength, and wrote the test down on a bottle, with the date, so that we knew we had fresh solution all the time, and knew it was of the proper strength

and alkalinity. This is a great help. The making of it is more or less tedious, especially testing it. You can't buy commercial tablets, drop them in water, and expect results.

The Dakin solution does something which no other solution seems to do. We tried salt solution and various other things, and while we kept the wound pretty clean, never got the bacterial count down, or as rapid healing as under the Dakin solution properly made.

It is very unstable, even under the best conditions. It always has to be in brown colored bottles and cannot be exposed to light. Direct sunlight causes it to deteriorate very rapidly. If left over one day we never used it up the next. Fortunately it is a very inexpensive substance to make. The ingredients do not cost much, and what you waste need not be figured in.

So much for the Dakin part. Now for the Carrel part. First of all is thin radical surgery. The wound has to be opened up wide. It has to be made to look like a saucer or trough, with pretty extensive surgery, although we often found it could be done without a whole lot of mutilation. The principal thing is to get that shaped wound in the bone. You can push the muscles to one side and immediately after operation, if you pack the wound full of gauze and leave it for 24 to 48 hours before you start the Dakin solution, you find when you take the gauze out the muscles are out of the way. Of course Carrel was the man who worked out the principle of the tubes, and he worked it out on perfectly sound physical grounds, so that if you don't carry it out just as he planned it, you won't get results. It is obvious that no more solution will run out of one end of the tube than you put in at the other end; likewise, if you have a tube open at one end and tied off at the other end, with small holes on the sides for outlets, the solution will run out of a few holes, and none out of the other holes. Part of the wound will get the solution, and the other part won't. The tube made must be exactly as Carrel worked it out. There is a good, logical, reasonable explanation for every little fussy point he makes.

Then you must use enough tubes so that every bit of your wound gets solution. It does not do any harm if you use too much, except that it will run out on the patient and make him a bit uncomfortable, but it is harmful if you don't use enough so that the whole wound gets covered. It is easy to tell at the first dressing whether you have got enough tubes. When your first dressing comes off the whole wound should have a sort of a slimy appearance. If you find a certain area that is pretty bright red, that little spot was not getting the Dakin solution, and it won't heal. In three or four days you will find a little slough there if you don't get the Dakin on there pretty quickly.

As to the dressings, it was only exceptionally that we found we had to dress more than once a day. These tubes of course project out through the dressings, and each tube gets an instillation of Dakin every two hours, and that means night as well as day. If you skip an instillation you will notice it the next day when you do the dressing. It has to be done every two hours, and there is a definite reason for it. We used to start with continuous irrigation of these wounds, drop by drop, with the result that the patient was always saturated. Every two hours is just as good. The Dakin solution gives the bacteria in that wound such a kick that they don't recover in less than two hours. It is also better for the patient and does away with a lot of cumbersome apparatus.

Just at first it sometimes bothers the patient a little having the treatment at night, but after a while he takes it without waking up. The great majority of them don't wake at all when it is given, after the first two or three days. In fact, it was quite a common complaint to have the patient tell you that he did not get his Dakin in the night.

The man who does the operating ought to do the dressings. The results are not so good if he does his operating and then hands the cases over to somebody else, because every one has a little different way of doing these things. The man who operates knows where he wants the tube to go, and it is hard to tell somebody else just how to do it.

If you can get up some team work with this technique you will get along faster. With team work it is very easy to go right down a ward and do 25 or 30 dressings in two hours. Each one knows just what to do, and does it, and then the nurse comes around and pours the Dakin into the tubes. The team work is a great help. Otherwise the dressings become rather tedious affairs.

There are four definite principles which govern the whole treatment. The first is radical surgery, which we can call the mechanical cleansing, opening up all the places and getting out all the dead tissue. This is followed by chemical cleansing by the use of Dakin's solution. We control the wounds by making bacterial counts. Just at first it is useless to make bacterial counts, because the wound is full of bacteria anyway, but when the wound begins to look fairly clean then it is time to take these counts. Sometimes you have awfully nice, clean looking wounds which you would swear were sterile, and the count is from 60 to 100. Anything over 50 we call infinity; one bacterium in five fields, we call surgically clean. These wounds can be sutured and they heal by first intention.

In the past cultures were made from all of these wounds, because it was thought they might have streptococci, but when

they found that if the count got down as low as one in five fields, there were no streptococci or gas bacilli. We do not close a lot of them, because it means giving the man ether again, sewing up his wound, and taking stitches out in anywhere from a week to ten days. We found that if it did not suture, the wound would heal in about the same length of time, so what was the use of taking a chance that you might reinfect it? We decided that it was just as well to let them heal themselves.

One other thing which I wish to speak about is the scars of these wounds following the use of Dakin treatment. Invariably whitish, tough-looking things, they are thin and they stretch. We had one man with a very bad wound back of the shoulder, who came to us with his arm tied down just by scar tissue. After we took him in hand and gave him the Dakin solution it formed one of those nice, pliable scars in a short time, so that he could put his hand to the top of his head, which he had not been able to do for some time.

Of course there are certain disadvantages to this method which can never be overcome. In the first place, it is awfully fussy, but if you once get the thing running right it runs itself. Then, too, the solution, of course, is unstable and won't keep, so that it ought to be made freshly every day. In the next place, doing it day by day, the dressings do get rather tiresome. There are some mornings that you don't think you can possibly get around, but after you look at the wounds and see how nice they look your enthusiasm comes back and you get at it. From 20 to 25 were the average number of dressings we did on each case.

Another disadvantage is the skin irritation. Dakin's solution is not irritating in a fresh wound or in a wound that has been having it, but seems to promote healing. However, it does attack normal skin around the wound, and that has to be protected. Of course if it is properly protected you won't often get this irritation. Of our 300 cases we found just one man whose skin would not stand it in spite of all kinds of precaution. We found all kinds of skin, from the tough, heavy kind up to the light-haired, freckled-face young fellow whose skin blistered when he went out in the sun. This one man gave us a great surprise, because he looked as if he had a good skin, but Dakin caused a terrible dermatitis, and we had to stop giving it.

The advantages of this method far outweigh the disadvantages. In the first place, the patients were comfortable in spite of these great wide open wounds. They are even glad to have you come around and dress them, because it doesn't hurt. It seems marvelous when you get all through and the patient says it did not hurt him at all. I never saw anything else used in wounds which made them so painless. We had all kinds of mentalities, too.

At the first dressing they did complain a little bit, but after that there was no complaint. The wounds are so clean it is a joy to look at them. You don't see any pus in any of them. They are clean except for a rather slimy stuff which is not disagreeable at all, and there is no odor. We had a ward full, at least fifty men, and there was none of that septic smell that we are so familiar with. There was a good clean smell all around the hospital. From the Dakin solution you get only that faint odor of lime which is not at all disagreeable.

The wounds certainly heal faster than I have ever seen them before. You can almost see them grow from day to day. We are no longer afraid of making a tremendously long wound for fear that it will be a long time healing. The wound has got to heal from the bottom, or you will be in trouble at the end. Sometimes it is quite a different problem to keep the sides from healing first. The skin should be scraped off if it is growing too fast, so as to let it heal up from the bottom. The same is true with the bone cavities.

DR. COTTON AND I HAD QUITE A LITTLE FRIENDLY ARGUMENT AS TO WHICH WAS BETTER, THE WAX OR DAKIN'S. I THINK THAT EVERY CASE IS NOT SUITABLE FOR THE WAX, AND I HAVE NOT YET SEEN THE CASE WHICH IS NOT SUITABLE FOR DAKIN'S SOLUTION.

DR. C. W. PEABODY, BOSTON: I HAVE LISTENED WITH A GREAT DEAL OF INTEREST TO THE PAPER THIS AFTERNOON, BECAUSE I THINK I UNDERSTAND HOW MUCH TIME AND INVESTIGATING IT MUST HAVE MEANT FOR MAJOR COTTON.

I perhaps can speak from an unprejudiced standpoint, because I am a convert to this method from a prejudiced point of view. I started in about three years ago, in France, trying out the Carrel-Dakin technique, when at the time, at that particular place, we used any kind of tubes with holes in the sides, with a sodium hyperchloride solution called Eusol. This was too caustic and very irritating. Results showed at first a very encouraging outlook for the immediate sepsis, and then no further result in closing up the wounds. I had an opportunity before leaving to see the technique in one of Carrel's own hospitals carried out accurately. I think it is true that, in connection with the war work we have more conveniences and more time in this country to do the necessary pains-taking technique.

I think it would be interesting for the Society to understand a little more fully the type of the cases we have received at No. 10. They are old wounds with some union, a callus which is very large to external examination, partly fibrous and bone, considerable quantities of very foul pus, frequent constitutional reactions of fever, etc. This callus will often be honeycombed with absorption areas of bone. These men probably got a very good clean-up to start

with, but in their transportation, etc., the wounds have been allowed to close up too soon. Those, I think, represent a more serious problem than the osteomyelitis in civil practice. It seems to me very striking, and absolutely true, as Major Cotton says, that there is no secondary osteomyelitis following this method. That does not mean that no patient has had to have a second operation, because sometimes there was a little cavity in this fraction of the callus where there was some small sequestrum, but the bone that had been cleaned out at the time of operation had stayed healthy.

There is another important point which is worked out in this treatment, and that is the absence of secondary reactions after operation. Instead of seeing a very high temperature for the next two days, with local pain, that is pretty nearly absent. I have found that to be aided a good deal by inserting at the time of the operation Carrel-Dakin tubes packed with gauze and beginning instillation early. The result is that you get the jump on the secondary infection before it has had time to spread into the surrounding tissues. Sometimes you cannot stop the oozing and therefore you simply have to pack solid with gauze and leave it in, and these cases have always shown more painful dressings in comparison, and more general reaction. Of course the Dakin cannot be started immediately because of the neurolytic action of the Dakin solution.

In the subject that Major Cotton has presented on the short cut, or the bone wax idea, I was very much prejudiced against that, but had to modify my stand a good deal; but, as he has pointed out, those cases have to be selected.

After phenol cauterization and bone wax all that results after the operation is a thin serous discharge until the wax is finally extruded by the new tissues filling up the cavity. On the other hand, a cavity, partly bony and partly fleshy, suppurates and extrudes wax very easily. I think the explanation for that is to be found in the sterilization process which takes place in a wound with pure phenol, yet without danger to the patient, because it will coagulate, and not be absorbed. When you are dealing with soft tissues, coagulation prevents sterilization of the channels in the soft tissues, which are not immediately reached by the solution as soon as it strikes the wound. That type of wound we packed with bone wax, and it loses it much more quickly.

The secondary suture problem is a rather difficult one, applied to this particular type of case: You are bound to get quite a large scar, which generally results in difficulty in making the two sides of the wound meet. You expose, by dissection, a considerable area which may not be sterile, and secondary drainage may have to be adopted. I note that Hawley started out with 80 per cent. of failures, and came out with

about the same percentage of successes. The difference in results was probably due to the selection of cases, in a great measure.

Major Cotton brought out one case which I think was very interesting. The patient came to my ward suppurating after a bone graft for non-union which had not had sufficient time to become aseptic before secondary operation. There was a large area of exposed graft. We went to work with the Carrel-Dakin tubes and closure started right away. The infection was a staphylococcus aureus infection, yet in two weeks the wound was superficial and healing perfectly.

DR. J. E. GOLDFTHWAIT, Boston: In the first place, of course the Carrel-Dakin solution which has been described is undoubtedly the best method of sterilizing these wounds if you can control the conditions, but it is a very difficult method to use and its success depends absolutely upon the technique. It is really useless to turn a method of this sort loose upon the profession for general use in the wards unless you have someone who is checking it up all the time. The percentage of difference between its being harmful and useful is extremely small. The solution is unstable; that is the secret of its efficacy, and for that reason we should pay no attention to those so-called solutions that are stable. They are absolutely of no use.

If you can control your technique, the Carrel-Dakin method is unquestionably the best method you have for sterilizing these wounds. If you cannot, then don't fuss with it at all. Give it up entirely, and go back to the plain yellow soap solution, which is one of the best things you can apply. When you analyze it, there is a reason for it. Your harmful organisms will not grow in a strongly alkaline solution.

Some of the worst cases I saw were in the winter of 1917, on the British front, and these were treated entirely with plain yellow soap solution. It is one of the best dressings that you can use, but of course when you can control your technique, without any question, the Carrel-Dakin is the best we have.

It seems to me that in regard to the wax, the men should go away from here clearly understanding that the principle of the wax is all right provided you have sterilized your wound first. If you have not sterilized your wound, you will have the same result with wax that we did a dozen or more years ago, coming to other methods simply because it was difficult to cleanse your wound. If you are going to use wax, open your wound wide and don't be afraid.

DR. LINCOLN DAVIS, Boston: There is one question I would like to ask in regard to bone wax, which I have not seen used. Where you have a large cavity in the bone can you coat it while that cavity is closed? I am not quite clear what the mechanical process is of the closure of that cavity.

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FIG. A.—Photograph, lateral view. Camera placed in position of x-ray tube.



FIG. B.—Antero-posterior view, showing distance and position of head.



FIG. 1.—A skeleton that has been disarticulated and then articulated and x-rayed in lateral position (not a true lateral position).



FIG. 2.—Same. (True lateral position.)



FIG. 3.—Normal lateral view, showing lines drawn to illustrate method.



FIG. 3 a.—Same case as Figure 3. (1) Anterior portion of posterior tubercle of atlas; (2) anterior portion of spinous process; (3) anterior tubercle of atlas.



FIG. 3 b.—Plate made to show the posterior arch. (Not a true lateral.)

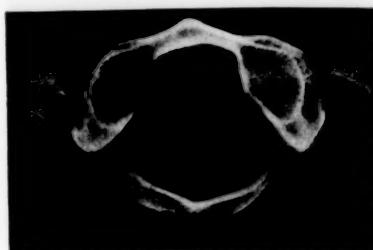


FIG. 3 c.—X-rays of the atlas, axis, and 3rd cervical vertebra in the same diameter to illustrate the difference in size of the spinal foramen between these three vertebrae.

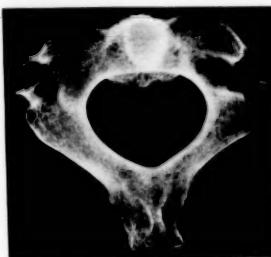


FIG. 3 d.

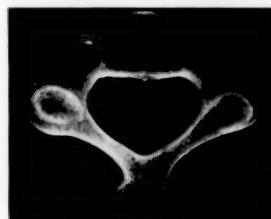


FIG. 3 e.

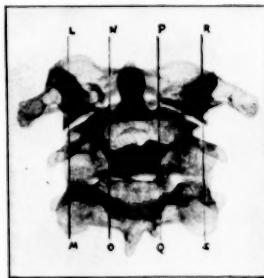


FIG. 4 a.—Articulated skeleton. It is impossible to articulate perfectly these three bones in the specimen.

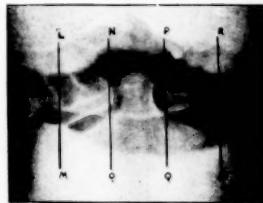


FIG. 4.—Antero-posterior view, with lines drawn on plate of a normal living case.



FIG. 4 c.—Normal living case. (1) Outline of posterior arch; (2) outline of anterior arch. To differentiate, note that the posterior arch in continuity continues and merges with the transverse process. Also note the clear space between the articular process of the atlas and axis.

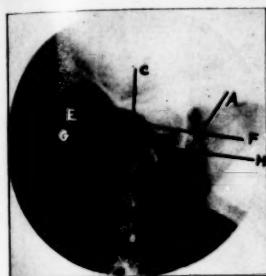


FIG. 5.—Forward dislocation of the skull, atlas, and axis, with lines drawn. (Compare with Fig. 3.)



FIG. 6.—Forward dislocation of the skull, atlas, and axis, on the 3rd cervical vertebra, with a fracture of the body of the axis. Note the width of the actual fracture can be seen or not, the anterior portion of the posterior tubercle of the atlas is anterior to the anterior portion of the spinous process of the axis and the spinous process of the axis is anterior to the spinous process of the 3rd cervical. (Compare with Fig. 3 or 3 a.)

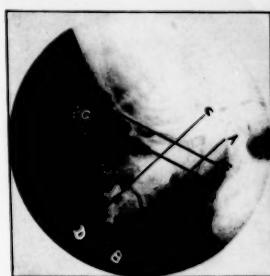


FIG. 7.—Lines drawn to illustrate method—same case as Fig. 6.



FIG. 8.—Luxation of skull and atlas on axis due to a destructive bone disease of body of axis (near growth). See Fig. 8b.

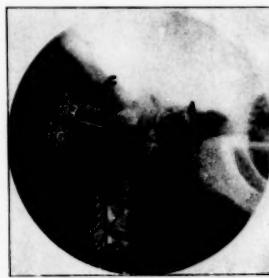


FIG. 8 a.—Same case as Fig. 8. Lines drawn to illustrate method.



FIG. 10.—Probable fracture of one portion of the posterior arch of the atlas. (The writer is indebted for the loan of this plate to Dr. Paul F. Butler.)

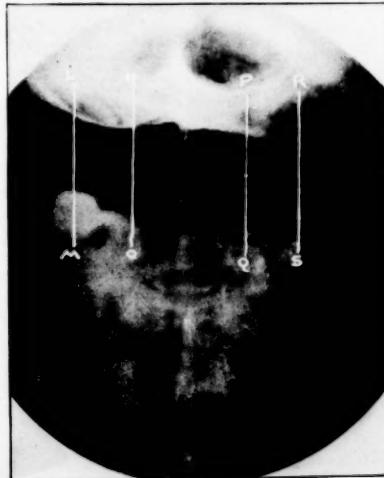


FIG. 9.—Fracture of posterior arch of atlas. Compare with figures 4, 4 a, 4 b.



FIG. 3 b.—Plate made to show the posterior arch. (Not a true lateral.)



FIG. 3 c.—X-rays of the atlas, axis, and 3rd cervical vertebra in the same diameter to illustrate the difference in size of the spinal foramen between these three vertebrae.



FIG. 3 d.

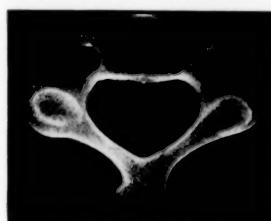


FIG. 3 e.

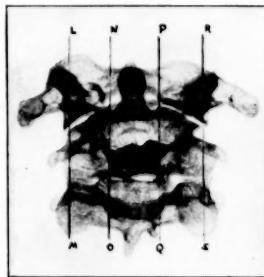


FIG. 4 a.—Articulated skeleton. It is impossible to articulate perfectly these three bones in the specimen.

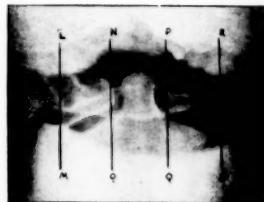


FIG. 4 b.—Antero-posterior view, with lines drawn on plate of a normal living case.



FIG. 4 c.—Normal living case. (1) Outline of posterior arch. (2) Articular process of the posterior arch. To differentiate note that the posterior arch in outline continues and merges with the transverse process. Also note the clear space between the articular process of the atlas and axis.

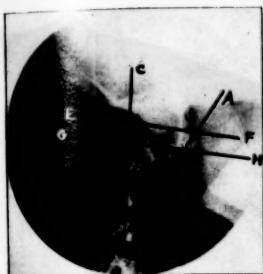


FIG. 5.—Forward dislocation of the skull, atlas, and axis, with lines drawn. (Compare with Fig. 3.)



FIG. 6.—Forward dislocation of the skull, atlas, and axis, on the 3rd cervical vertebra, with a fracture of the lamina of the axis. Note that whether the actual fracture can be seen or not, the anterior portion of the posterior rib of the axis is anterior to the anterior portion of the spinous process of the axis and the spinous process of the axis is anterior to the spinous process of the 3rd cervical. (Compare with Fig. 3 or 3 a.)

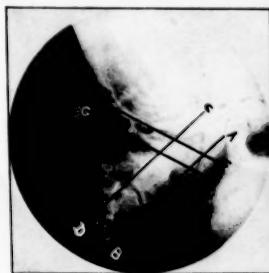


FIG. 7.—Lines drawn to illustrate method—same case as Fig. 6.



FIG. 8.—Luxation of skull and atlas on axis due to a destructive bone disease of the body of axis (new growth). See Fig. 8a.

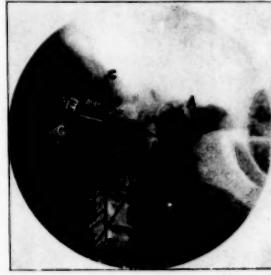


FIG. 8a.—Same case as Fig. 8. Lines drawn to illustrate method.



FIG. 10.—Probable fracture of one portion of the posterior arch of the atlas. (The writer is indebted for the loan of this plate to Dr. Paul F. Butler.)

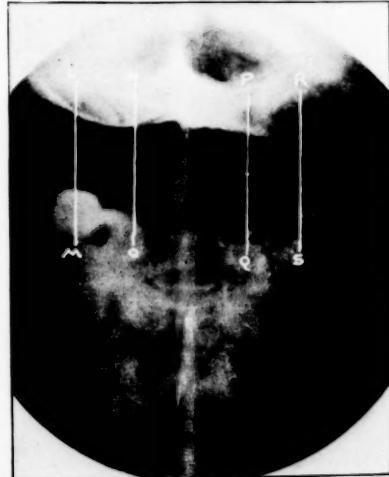


FIG. 9.—Fracture of posterior arch of atlas. Compare with figures 4, 4a, 4b.

A METHOD FOR MORE ACCURATE STUDY OF INJURIES TO THE ATLAS AND AXIS.—GEORGE.



FIG. 11.—Forward dislocation without fracture of the skull and atlas.



Figs. 12, 13, and 14.—Congenital malformation converting the vertebral groove into a complete and partial foramen.



FIG. 13.



FIG. 14.



FIG. 15.—Partial dislocation of the skull, atlas, axis, and third and fourth cervical vertebrae with a crushing of the body of the fourth vertebra.

DR. A. P. MERRILL, Pittsfield: I would like to ask Major Cotton a question. Do you first sterilize these cases by pure carbolic and alcohol? If so, does that not form a film of cauterized bone tissue through which the new bone tissue has got to work? Do you rely on the throwing out of bone tissue at the edge, or does it come also through this film of cauterized bone?

DR. FREDERIC J. COTTON (answering Dr. Lincoln Davis): I think the original scheme, as Dr. Goldthwait knows, was to use it as substitute for bone, to pack up cavities which are left with wax in them, just as the fatty transplants. That did not work out very well. It never worked out with me. For a good many years I have used bone wax on the basis that it would be eventually extruded. It is gradually pushed out of the wound, and it leaves behind it a bed of granulation tissue, so that eventually you get your bone filling in. I have no right to say that the granulation tissue is necessarily osteoid. The cavity, when the thing was entirely healed, did not show lime salts by x-ray. Calcification of the whole cavity perhaps was never completed.

I do not feel that I want to use this method where there is not a sufficient cross section area outside to carry the weight. But on the whole, it represents simply a more certain and very much more comfortable way of doing things in this very selected and rather narrow type of case. The process is one that really belongs to chronic osteomyelitis rather than in these war cases.

DR. FREDERIC J. COTTON (answering Dr. Merrill): I pay no attention to the periosteum at all. I do not think there is any doubt but that you get a thin film of cauterized bone after you have sterilized. You put in crude carbolic for one and a half to two minutes by the watch. It is a question of not being afraid of carbolic, and you get a very easily demonstrated film on your soft parts. What does happen is that the granulation tissue goes up through that film, and it doesn't make any difference.

DR. COTTON (closing the discussion): I will just say in closing that we were working in a "repair-shop" hospital to clean up the cases, and had nothing to do with the battle-front work. There was perfectly wonderful work done there in the salvage cases. Ours were very late cases, and represented a practically definite, limited class of cases. I have presented them, not because they represent such a large share of the war work, but because they are very closely parallel to the civil problems. We do get a lot of these same cases in civil practice, which we happened to have the opportunity to familiarize ourselves with under war conditions.

A METHOD FOR MORE ACCURATE STUDY OF INJURIES TO THE ATLAS AND AXIS.

BY ARIAL W. GEORGE, M.D., BOSTON.

The following study of injuries to the atlas and axis, and the didactic method used, is the result of instructing medical officers for x-ray service at the Medical Officers' Training Camp, Fort Riley, Kansas, where it was found necessary intensively, and in the shortest possible time, to review the cervical region as well as all other parts of the body.

It was found in the beginning that the mere demonstration of x-ray plates did not suffice to make any very permanent impression upon the students and that their learning became a matter of mere imitation and was soon forgotten.

As the various classes came through the school, the method about to be described gradually unfolded itself. The principal object of this method is to leave with the students some fundamental facts: 1st, the study of the anatomy; 2nd, the variations from the normal.

The writer claims no special originality for the method and is indebted to the medical officers who were students and to the various instructors who throughout the time the school was in operation helped teach and suggest better methods of teaching. I am particularly indebted to Lieut. Harold Swanberg of Chicago, Ill., for his help on the subject.

NORMAL ROENTGEN ANATOMY OF UPPER CERVICAL REGION.

1. *Lateral View.* Before an interpretation can be made of the upper cervical region one must determine that the plate under examination has been taken in a true lateral position (See technique). This can best be determined by the position of the rami of the mandible. It is not possible exactly to superimpose the rami, though there should never be more than one centimeter's difference between the two. (See Figure 1, not a true lateral; Figure 2, a true lateral.)

In the true lateral position, an imaginary vertical line can be drawn along the anterior surface of the bodies of the cervical vertebrae (See line AB, Figure 3); also a similar line can be drawn, parallel to this line, along the posterior surface of the cervical bodies. (See line CD, Figure 3.) While these lines will not

hold good for the entire cervical region, for the purpose of diagnosis they are essentially true for the upper cervical region. In well developed male subjects, the anterior tubercle on the anterior arch of the atlas is frequently quite large and will project slightly anterior to the line drawn along the anterior cervical bodies. An imaginary line can also be drawn from the superior border of the anterior tubercle of the atlas to the superior border of the posterior tubercle. (See line EF, Figure 3.) It will be approximately parallel to a similar line drawn from the inferior border of the anterior tubercle to the inferior border of the posterior tubercle. (See line GH, Figure 3.)

Within the rectangle formed by lines AB, CD, EF, and GH (Figure 3), there is normally noted an increased density of bony structure. This is due to the fact that the lateral masses and transverse processes of the atlas, and the odontoid process of the axis are superimposed, and all lie within this area.

The area within the parallel lines EF and GH (Figure 3), posterior to the rectangle above mentioned, comprises the posterior extremities of the lateral masses and the posterior arch of the atlas, including the posterior tubercle. The relation of the posterior tubercle to the base of the skull varies, rarely being more than one centimeter from the base of the skull, except in congenital malformation. In a true lateral view each side of the posterior arch of the atlas should appear superimposed. If both sides of the posterior arch can be directly seen (Figure 3-B), it is positive proof that the atlas was not taken in a true lateral position, and without other sufficient evidence, injury is not to be considered. The posterior part of the posterior arch appears to project slightly upward. This is due to the fact that the anterior part of this same arch is flattened from above downward, due to the groove for the vertebral artery. (See congenital malformations.)

The posterior tubercle of the atlas is on a more anterior plane than the posterior extremity of the spinous process of the axis, but the anterior part of the posterior tubercle is never normally on a more anterior plane than the anterior part of the spinous process of the axis. This is due to the fact that the vertebral foramen of the atlas is larger than the corresponding foramen of the axis. (See Figure 3-C.)

The only apparent exception to this will be the congenital malformations of the atlas. (See congenital malformations.)

The retro-pharyngeal structures form a vertical line parallel to the anterior aspect of the cervical bodies. The uniformly dark area anterior to this represents the lumen of the pharynx.

An imaginary line can be drawn from the lower border of the body of the axis to the lower border of the spinous process of the same vertebra. (See line JK, Figure 3.) It is approximately parallel to the line drawn from the lower border of the anterior tubercle of the atlas to the lower border of the posterior tubercle. (Line GH.) In the rectangular space above the line JK, is the greatest part of the axis. The upper half of this area shows an increase in density of bone due to the lower part of the lateral masses of the atlas, the superior articular processes, body, and part of the odontoid process of the axis. The lower half of this rectangular space shows the body and transverse processes of the axis superimposed. The area posterior to the above rectangle, and between the lines GH and JK, contains the inferior articular processes, laminae and spinous process of the axis.

Normally there is no break in continuity in the upper and lower borders of the laminae of the axis. The anterior portion of the spinous process of the axis is always on a more anterior plane than the anterior part of the posterior tubercle of the atlas.

2. Antero-Posterior View. In an antero-posterior view of the upper cervical region, imaginary vertical lines can be drawn from the lateral and median margins of the lateral masses of the atlas (See lines LM, NO, PQ, and RS, Figure 4), passing through the lateral and medial margins of the superior articular processes of the axis and are approximately equally distant apart. The odontoid process appears in the central portion of the two median lines.

The hyaline cartilage on the inferior articular surface of the lateral mass of the atlas and the superior articular surface of the axis is of uniform thickness on each side, thus resulting in an apparent clear space on each side, since they offer no obstruction to the roentgen ray. The posterior arch can be recognized by a continuation of the shadow of the arch with the trans-

verse processes, and as it is in closer proximation to the plate than the anterior arch, it is more clearly seen on the plate. The anterior arch may be occasionally recognized, and can be demonstrated by its conjunction with the spongy bone comprising the lateral masses (See Figure 4-B). In the average case the apex of the odontoid process projects just above the shadows produced by the arches. From the roentgen standpoint, the superior articular surfaces of the axis are more or less flattened, or even slightly concave, and the inferior articular surfaces of the atlas are slightly concave. The body of the axis is of uniform density and structure, excepting in the median line, where we can sometimes see the shadow of the bifid spinous process of this vertebra.

PATHOLOGIC ROENTGEN ANATOMY OF UPPER CERVICAL REGION.

1. *Lateral View.* One of the most important observations that can be made of the pathology of the osseous system is the loss of the normal curves by the formation of acute angles. Injuries, destructive bone diseases, etc., will be early recognized by the formation of these angles (See Figure 6): this is particularly true of the vertebral column. In the interpretation of injuries and diseases, the value of the imaginary lines as mentioned above becomes of utmost importance, e.g.,—in one of the most frequent injuries of the atlas, forward dislocation of the head and atlas upon the axis, the following points are to be noted: First, that the line AB (Figure 5) will be no longer parallel to the line CD, and if extended would very soon meet. The vertical line produced by the retro-pharyngeal structures anterior to the anterior tubercle of the atlas will be distorted. The lines EF and GH will remain parallel, and the normal distance apart, but occasionally more of the lateral masses may be demonstrated on the plate. This observation must be kept in mind so that it is not confused with the production of new bony tissue in this region. The length of the posterior arch and tubercle behind the line CD is very much shortened. The anterior margin of the posterior tubercle will also be seen on a plane anterior to the anterior margin of the spinous process of the axis. Occasionally a fracture of the odontoid process can be recognized in the lateral position, but it is usually seen better in the antero-posterior view.

In Figure 7 will be noted that the vertical lines AB and CD do not continue along the anterior and posterior surfaces of the cervical bodies, being suddenly interrupted at the third cervical vertebra. The line formed by the retro-pharyngeal structures is also interrupted in the same area. Nothing can produce this change, except a forward dislocation of the skull, atlas, and axis of the third cervical vertebra. It will also be noticed that the anterior part of the posterior tubercle is on a more anterior plane than the anterior part of the spinous process of the axis, which is not normal. However, the relation of the remaining parts of the atlas and axis to each other is normal. Naturally one will wonder what condition can produce such a change. A careful examination of the laminae of the axis will reveal a break in continuity,—a positive diagnosis of a fracture. This readily accounts for the distorted relation of the posterior tubercle to the spinous process of this vertebra.

In Figures 8 and 8-A will be noted that the vertical lines AB and CD do not continue along the cervical bodies, being interrupted, as is also the line produced by the retro-pharyngeal structures. A diagnosis of anterior dislocation of the skull and atlas on the axis can readily be made. However, the outline normally formed by the body of the axis is distorted, and shows considerable less density than normal, which is diagnostic of a pathologic change in this body, which in this case is metastatic carcinoma. In the original plates it can be seen that the odontoid process has separated from the body of the axis and is in contact with the anterior arch of the atlas.

2. *Antero-Posterior View.* In Figure 9 it will be noted that the imaginary lines LM, NO, PQ, and RS, extending from the lateral and medial margins of the lateral masses, do not pass through the lateral and medial margins of the superior articular processes of the axis. The two lateral lines do not touch the axis at all, while the median lines pass through the center of the superior articular processes. The space between the two median lines is also much larger than normal. There is no position in which the normal head can be placed to secure this result. The only thing possible that will do this is a fracture of the anterior and possibly posterior arch of the atlas, thereby separating the lateral masses.

Dislocation, without fracture of the atlas, will

always obliterate the normal articular space between the inferior articular surface of the lateral mass of the atlas and the superior articular process on the side of the dislocation, or both sides. (See Figure 11.) There is no possible position in which the normal head can be placed to obliterate the normal articular space mentioned above.

Congenital Malformations of Upper Cervical Region.

The most important congenital malformation in the upper cervical vertebrae from the roentgen viewpoint is that of the posterior arch of the atlas. Comparatively frequently a bony spiculum is seen which arches backward from the posterior extremity of the superior articular process of the atlas to the posterior arch, converting the vertebral groove into a foramen, through which the vertebral artery passes. (See Figures 12, 13, 14.) This foramen should not be confused with an area due to destructive bone pathology.

ROENTGEN TECHNIC OF UPPER CERVICAL REGION.

1. *Lateral View.* The patient is placed in the prone position with the head resting on the table, the face being directed upward, parallel to the table. In this position a line perpendicular to the table can be drawn from the lower border of the upper incisor teeth to the tip of the mastoid process. If a lateral view of the entire cervical region is desired, the shoulders are forced downward as far as possible and a plate is placed on the lateral side of the neck, pressing down on the shoulder. The plate is held in (Figures A and B) position by a headrest, sand bags, etc. The tube is tilted on its side, a small diaphragm, together with a small cone, being used. The central ray is centred immediately posterior to the ramus of the mandible.

Another position which will give the same results is obtained by having the patient sit in a chair with the tube tilted on its side. The plate is held by an assistant against the neck.

2. *Antero-Posterior View.* In the ordinary antero-posterior view of the cervical region the upper two or three cervical vertebrae will not be seen, on account of the location of the mandible anterior to these vertebrae. In order to obtain an antero-posterior view of the atlas and axis it is necessary to place the patient on the table in a manner similar to that necessary for

a lateral view, *viz.*, prone position with head on table, face directed upward, parallel to table. The mouth is opened to its greatest extent, a cork being placed between the teeth to maintain this position, and a plate is placed well up under the occiput. A small diaphragm, together with a small cone, is used, the central ray being centered over the center of the open mouth.

DISCUSSION.

DR. S. W. ELLSWORTH, Boston: I feel that we are under obligation to Dr. George for describing a very simple and useful method of studying such a difficult part of the skeleton as the cervical spine. In the plates ordinarily taken of this part, the bony outlines are very indistinct; with the aid of the parallel lines, however, one should be enabled to study abnormalities of position or outline with greater accuracy.

Anomalies of the atlas occur more commonly than is generally supposed; they will be frequently found if searched for and should not be confused with traumatic deformities.

I have here as an example of the anomaly of the posterior foramina, the atlas from a skeleton which we have used in the study of x-ray plates, which shows the arches behind the articular facets.

This paper illustrates again the fact that we must review our anatomy repeatedly; careful study with the aid of the x-ray plates will show many new and novel conditions.

DR. G. W. HOLMES, Boston: I think we ought to thank Dr. George for giving us some help on a most difficult part of the anatomy to study with the x-rays.

It is of greatest importance to have an established normal in mind before attempting to interest the pathological. There are a great many things which may cause the normal to look abnormal. Even if particular care is taken in placing the patient, it is perfectly possible to have very abnormal pictures. It is a great help to have a definite standard in mind.

In regard to the question of using this method for teaching, I would say it would depend largely upon the class of students being taught. If you are teaching radiologists it would certainly be a good guide. But in teaching undergraduate students of medicine I should bring out a little more the clinical side. These students do not have a sufficient knowledge of x-ray interpretation to rely wholly upon the x-ray findings. It is much better, as a rule, for the student to keep in mind his clinical evidence, and I should try to impress upon him that if he has a picture which to him seems to be abnormal, his diagnosis ought to hinge more on the clinical findings than on the x-ray.

CERTAIN DIAGNOSTIC ASPECTS OF MEDICO-SURGICAL DISEASES OF THE GASTROINTESTINAL TRACT.

BY C. W. MCCLURE, M.D., BOSTON.

[From the Medical Clinic of the Peter Bent Brigham Hospital, Boston.]

As an introductory remark I wish to explain that I am neither a surgeon nor a radiographer, but I think no one can hope to accomplish much in diseases of the gastrointestinal tract who is not at least somewhat skilled in the fluoroscopy of that region.

There is, perhaps, no field in medicine more burdened with unproven theories than that of the diseases of the gastrointestinal tract. There are obvious reasons for this. In the first place the extent to which patients can be investigated is often necessarily so limited that but comparatively little can be accomplished in many phases of the field in question. Animal experimentation is very difficultly applicable to many phases of pathological gastrointestinal conditions in man due to many differences between man and animal, including differences in the nervous constitution of the lower animals as contrasted to that of man. Because of these difficulties there is frequently a lack of knowledge (1) of the etiological factors of gastrointestinal diseases, and (2) of the pathological physiology of these diseases.

As a result, there exists a great diversity of opinion regarding the question of the predisposing factors, the etiology, the basis for diagnosis and the proper treatment of most abnormal gastrointestinal conditions. A method which will assist in settling any of these questions is obviously of great value to the physician, especially to the internist. In the radiographic fluoroscope such a method is available. Fluoroscopy is ordinarily much more valuable than radiograms because of the length of time in which the movements of the stomach and intestines can be observed, the different views obtainable by changes in the position of the patient and the various manipulations that can be carried out. Radiographic photographs represent but fractions of seconds of time at the most and phenomena of importance are often missed as a result. Fluoroscopy presents a great field of still untouched problems. Nevertheless, much that is valuable is known about the interpretation of the appearance of the aliment-

ary tract after feeding a meal of an opaque salt, such as barium sulphate. It is my impression that the value of the fluoroscope and of a certain number of fairly common fluoroscopic findings are not generally known, or if they are known their importance does not seem to be appreciated. It seems desirable, therefore, to discuss some of these findings. In order that they may be more fully understood a short discussion of the phenomena normally occurring in the passage of a barium meal through the alimentary tract will be given.

The bolus of the meal stops momentarily at different regions during its passage through the esophagus. The longest delay occurs at the cardiac orifice of the stomach. The stomach itself is examined (1) for a residue of a barium meal given six hours previous to the examination, (2) for the different types of peristalsis, especially hyperperistalsis, (3) for focal areas of abnormal muscular contractions in the walls of the stomach, (4) for spasms and deformities of the stomach walls, and (5) for abnormalities in the size, shape, and the position of the stomach. The first portion of the duodenum leading off from the stomach, the so-called duodenal cap, is examined for deformities in its outline. The remainder of the small intestines and colon we shall not consider at present.

Two phenomena encompass the majority of abnormalities seen by means of the fluoroscope. These are (1) the functional muscular phenomena of overactivity on the one hand, and atony on the other hand, and (2) actual structural changes in the walls of different parts of the alimentary tract. These structural changes produce very distinct deformities and their significance is generally appreciated. But abnormal appearances due to muscular phenomena are often not so striking nor their meaning so universally recognized. Indeed, the diagnostic status of many muscular phenomena as seen through the fluoroscope is not definitely settled. The best known of the muscular phenomena are hyperperistalsis, the spasm producing an incisura, and atony. The clinical significance of spasms and of hyperperistalsis in the stomach are prone to be neglected by internist and surgeon alike. These conditions may not be diagnostic of any lesion in themselves but a certain number of them furnish confirmatory evidence that at times is of the utmost aid in diagnosis.

The following cases will illustrate this and,

also, the difference in appearance between muscular spasm and actual deformity:

CASE 1. E. A., white, male, aged 45. O.D.D. No. 52418. Diagnosis: Carcinoma of the esophagus. The past medical history was essentially negative. He had lost ten pounds in weight during the last few months. The present illness began six years before admission. It consisted of epigastric distress after meals. Occasionally severe epigastric pain would also occur. Beginning three months ago the patient had noticed increasing difficulty in retaining food. On admission to the Out-Door Department but little food could be taken without immediate regurgitation. Physical examination, except for evidences of some loss of weight, was essentially negative.

Roentgen report. No. 13785. The esophagus was slightly dilated. The swallowed barium stopped in the region of the cardia. This portion of the esophagus was irregular in outline. A little barium trickled through into the stomach. Visible peristalsis was seen in the esophagus and at times it was reversed in type.

Laboratory findings were negative. The Wassermann reaction in the blood serum was negative.

CASE 2. C. E. H., white, female, aged 55. S. No. 10159. Diagnosis: Cardiospasm. The past medical history was essentially negative. The present illness dated from an attack of pneumonia at the age of 28 years. From that time up to the age of 50 years there was occasional regurgitation of swallowed food. During the past five years, after eating a considerable quantity of food, it would frequently all be regurgitated and spit out of the mouth. Except for evidence of a poorly nourished condition, the physical examination was essentially negative.

Roentgen report. No. 14421. Six hours after the barium meal there was seen a large, somewhat fusiform, sharply defined shadow overlying that of the heart. Its lower extremity was conical in shape. A small quantity of the barium meal had reached the stomach. At the cardiac orifice of the stomach there was an almost complete obstruction, only a fine stream of barium was seen to run through it into the gastric cavity. The findings were those of marked dilatation of the lower end of the esophagus, due to cardiospasm.

Laboratory examinations were negative. The Wassermann in the blood serum was negative.

CASE 3. E. V. W., white, female, aged 21. Med. No. 10783. Diagnosis: Ulcer of the stomach (non-perforating); mitral stenosis. For the past five years the patient had had gastric attacks every few weeks consisting of nausea, headache, and vomiting. Acute gastric symptoms began one year ago with severe epigastric pain occurring about one hour after meals, while slight pain was present most of the time. Finally hematemesis occurred and the patient was given medical ulcer treatment with an apparent cure. Two months before admission to the Peter Bent Brigham Hospital the epigastric pain recurred. The physical examination was negative except for the signs usual for mitral stenosis.

Roentgen report. No. 14451. The stomach was normal in position and tone. It was freely movable. There was hyperperistalsis and a small six-hour residue. In the antrum near the sphincter was a small area in which peristaltic waves did not occur. This same condition persisted on two examinations made at twenty-four-hour intervals. The duodenal cap came off at one side of the sphincter. The cap itself was normal in position and in outline. The ileum was not remarkable. At the end of six hours the head of the barium column had reached the transverse colon and in 24 hours it was in the rectum. The cecum was normal. The appendix was not seen. The findings indicate the probability of a small ulcer in the antrum and involving the sphincter.

The laboratory findings in the urine, blood, and stools were negative. The fasting gastric contents contained no free HCl and showed a total acidity of 16. One hour after a test breakfast, the contents showed free HCl 22 and total acidity 50. The benzidine occult blood test was positive.

At operation a small ulcer in the antrum was found.

CASE 4. P. J. B., white, male, aged 40. Med. No. 10993. Diagnosis: (?) Gastric ulcer. A year and a half ago, following a fall, the patient had symptoms similar to the present attack. The present illness began seven weeks prior to admission to the Peter Bent Brigham Hospital and again followed mild trauma. The symptoms consisted of burning epigastric pain coming on about a half hour after meals.

Occasionally nausea was present, but no vomiting. The physical examination was essentially negative except for some tenderness in mid-epigastrum.

Röntgen report. No. 14697. The stomach was normal in position, tone, outline, and freely movable. The peristalsis was irregular and sluggish; at times three waves were visible. There was a small six-hour residue. On the lesser curvature, proximal to this antrum, there was an area in which no peristalsis occurred, although peristaltic waves were seen to pass over the greater curvature opposite this area. The same phenomena were noted on a second examination one week later. There was no irregularity in outline of the stomach. A good sphincter and first portion of the duodenum were seen. At the six-hour observation the ileum contained the entire barium meal. The cecum was not seen.

The laboratory findings in the blood, urine, and stools were negative. The fasting gastric contents were 34 c.c. in amount and showed no free HCl. The contents removed after a test breakfast contained free HCl 30 and total acidity 45. There was no occult blood. The Wassermann reaction in the blood serum was negative.

There are several features of importance in diagnosis which are illustrated in the cases which have just been presented. The two cases of involvement of the cardiac orifice of the stomach represented well the different picture produced by muscular spasm and actual structural deformity. In the case of cardiospasm (Case 2), the greatly dilated esophagus was smooth in outline. In the case of carcinoma (Case 1), the esophagus was but little dilated and its lower end very irregular in outline. In the diagnosis of lesions in the cardiac end of the stomach the fluoroscope is of indispensable value. Often lesions in this region are not visible in the radiographic plates after the stomach is filled with the barium meal; or the gas bubble in the fundus may prevent that region from filling with the barium salt and hence no irregularities are manifested. One of the most important parts of the radiographic examination is the observation of the barium meal as it enters the stomach. Lesions high up on the lesser curvature frequently cause marked swirls in the barium stream as it falls through the cardiac orifice, which are diagnostic evi-

dences of a new growth in that region. Structural deformities, due to perforating ulcers, may be seen at this time, while after the stomach has filled they may not be visible. Neoplasms involving the top of the fundus of the stomach may best be demonstrated by the fluoroscope after filling that region with the barium meal. The demonstration is made possible by the fact that the inspiratory contraction of the diaphragm presses on the fundus of the normal stomach and causes it to assume a very different shape from that found during expiration. A new growth in the fundus may stiffen its walls and prevent these changes in shape from occurring.

The factors in the fluoroscopic picture which are significant of ulcer are hyperperistalsis, an incisura, a residue six hours after the barium meal, and a deformity of the stomach walls. In the case of gastric ulcer (Case 3) and the case of questionable gastric ulcer (Case 4), which have just been presented, there were no true deformities of the stomach walls, but there were focal areas in which peristalsis did not occur and which is considered to be the result of muscular spasm in these areas. The radiographic findings were not necessarily diagnostic of gastric ulcer, since both the hyperperistalsis and the muscular spasm may result reflexly from conditions outside the stomach. But the radiographic findings, especially the focal area of muscular spasm in one of these cases (Case 3), when combined with the history, particularly that of the previous hematemesis, made a very good picture of gastric ulcer. Furthermore, had it not been for the fluoroscopic findings this case would not have been recommended for operation. In the other case (Case 4), the onset following mild trauma pointed to a neurosis as the cause of the symptoms. But the radiographic findings in this case were strongly indicative of ulcer. In such cases it seems wise to institute medical treatment for ulcer and to allow the progress of the case to govern further therapeutic measures. The radiographic findings in these two cases were such that it is questionable whether the radiographer should attempt a diagnosis. In any event it is not his province to do so. There are relatively few x-ray findings which are diagnostic in themselves, but there are many concerning which the radiographer can make valuable suggestions. It is usually unfair to ask

the radiographer for more than a description of his x-ray findings and for suggestions as to their meanings. To ask him to make a diagnosis means that he is expected to be highly skilled in medicine, surgery, and many of the specialties. The findings in these cases show the importance of the physician learning to interpret the roentgenologic findings in relation to the clinical symptoms in a given case, in order to be able to glean the most benefit from x-ray studies.

Spasms of the musculature of the gastrointestinal tract, as has already been stated, may be due to extraneous causes. These may be functional or organic. Extrinsic spasm is commonly differentiated from intrinsic spasm by the fact that the former is usually not present upon a second examination and that it almost invariably disappears after the administration of atropine. The following case may be used as an illustration:

CASE 5. E. C., white, female, aged 41. O.D.D. No. 55822. Diagnosis: (?) Cholelithiasis. The patient had had attacks of bronchial asthma for several years. Seven years before admission to the Out-Door Department she had had a uterine operation of unknown character. The present illness dated back nine years. It consisted of very severe epigastric pain, lasting from a few hours to a day, unless relieved by morphine. The pain occurred at irregular intervals. At times it would begin in the left hypochondrium and radiate to the epigastrium and to the back. Physical examination was essentially negative. Radiograms of the gall bladder and the kidneys showed no shadows of calculi.

Röntgen report. No. 14691. The stomach was low in position, normal in tone and outline. There was no residue remaining from the barium meal given six hours previous to the examination. On feeding the second barium meal hyperperistalsis was present. A constant incisura was seen in the pars media of the stomach and persisted throughout the examination. Twenty-four hours later another barium meal was given, but the incisura was not again found. The ileum contained a six-hour residue, at which time the head of the barium column had reached the transverse column. In twenty-four hours it was in the rectum. The cecum was normal.

The laboratory findings were negative.

One factor of interest concerning the radiographic findings in the examination of the duodenum is the presence of deformities which are artifacts. From time to time one sees in the report of some radiographer's findings the description of a deformity in the first portion of the duodenum. Upon making another fluoroscopic examination of the same patient, one may be surprised not to find the deformity described. It should be emphasized that the deformity may have been an artifact such as may be caused by the pressure of some extraneous body, often the spine, or the duodenum, or it may be due to transitory spasms. Such artifacts must be ruled out before making the diagnosis of a persistent deformity in the duodenum from the fluoroscopic picture. When a duodenal deformity is reported in a case in which that finding cannot be accounted for clinically, the radiographic studies should always be repeated. On a second examination, the deformity may not again be found. If such a deformity persists, radiographers are prone to make the diagnosis of superficial ulceration. Whether or not this diagnosis is correct, in the absence of clinical symptoms of ulcer, it may be questioned. One certainly hesitates to advise operation without more evidence, and as a result the significance of the fluoroscopic findings remains unsettled in this type of case. However, it appears rational to advise medical treatment.

Antiperistalsis, or reversed peristalsis, invariably points to some lesion in the gastrointestinal tract, which is usually, but not always, obstructive in type. It may accompany gastric lesions remote from the pylorus. For instance, Dr. McCarty and I have observed antiperistalsis occurring above a perforated gastric ulcer situated on the lesser curvature some distance from the pylorus. Antiperistalsis can, of course, be demonstrated only by the fluoroscope. Its value as a diagnostic measure is illustrated in the following case:

CASE 6. E. C. W., white, female, aged 18. Med. No. 10721. Diagnosis: Visceropexis; hyperchlorhydria; partial obstruction at duodenal-jejunal junction. During the past three years the patient had had, three or four times a year, attacks similar to the present one, but not so severe in character. Ten days before admission to the hospital she had severe pain in the umbilical region, persisting about one

hour. A similar attack of pain recurred the next day, and at the time the patient vomited once. Three times since then similar attacks of pain occurred, but there was no vomiting, although nausea was present. The physical examination was essentially negative.

Roentgen report. No. 14452. The stomach was low in position and to the left, the greater curvature being below the level of the symphysis pubis. It was freely movable, atonic, and peristalsis was sluggish. There was a small residue in both the stomach and duodenum of the barium meal given six hours previously. The sphincter and first portion of duodenum appeared normal. The second and third portions of the duodenum were dilated and showed reversed peristalsis. At the end of six hours after the barium meal the head of the barium column was still in the ileum. At the end of twenty-four hours it had reached the rectum. The cecum was normal in outline; it was situated in the pelvis and it contained a twenty-four-hour residue. The appendix was not seen. The findings were those of ptosis and partial obstruction at the duodenjejunal junction.

Examination of the urine showed a slight glycosuria. The fasting stomach contents showed free HCl to be 76 and total acidity 98; after a test breakfast free HCl was 64 and total acidity 146. No occult blood was present. The Wassermann reaction in the blood serum was negative.

In this case the diagnosis of obstruction rested very largely upon the presence of anti-peristalsis. We have seen the duodenum larger even than in this case without other evidences of obstruction either from the radiographic or clinical standpoint.

Before leaving the subject of roentgenology one feature, apparently often neglected, will be mentioned. Operations on the stomach and intestines should always be followed by a detailed fluoroscopic report and radiograms of the operated region a month or two after convalescence has been established. If a question of a new lesion arises, perhaps several years afterwards, the abnormal conditions resulting from the operation may make the interpretation of further radiographic studies difficult, or even impossible. This is well illustrated by a case recently referred for x-ray studies. Two years previously the patient had had a gastroenterostomy performed for a duodenal ulcer, with

apparent recovery. At the time she was referred for radiographic studies she had been suffering for a month with epigastric pain, occurring three or four hours after meals. There had been rather frequent vomiting. On fluoroscopic examination the barium meal was seen to leave the stomach through the pyloric sphincter and through the stoma of the gastroenterostomy. There was a deformity in the first portion of the duodenum. No post-operative radiographic studies had been made soon after the laparotomy two years previously. Therefore, whether or not the deformity was of recent development could not be determined.

Another phase of the gastrointestinal field which has received more attention than even roentgenology is that of diet and medication. Diet and medication may be made of direct and practical value in the diagnosis of gastrointestinal disorders. The factors which led up to the work on which this statement is based are of interest. In the first place, a collection of the dietary measures and of the theories concerning their application of different well-known gastroenterologists demonstrated the existence of a great diversity of kinds of foods to be used in, and of opinions concerning the treatment of, each and every type of gastric and intestinal disorder. For example, diets for ulcer vary from the high caloric meat-containing regime of Lenhardt through the milk and alkali treatment of Sippy to the starvation method of von Leube. Just as radical differences exist in the treatment advised for other conditions such as hyperacidity, hypersecretion, chronic dyspepsia, etc. These findings might well lead one to question the importance of dietary measures in many of the gastrointestinal conditions. So the first of this year a study of the reaction of patients with certain of the gastrintestinal disorders to a wholesome general diet was begun. From the results so far obtained it may be stated that in every case in which it was proved that a patient could not eat with comfort a diet rational for a healthy person leading about the same mode of life, some apparently definite underlying cause was found. The most common of these causes have proved to be (1) functional nervous conditions, (2) organic disease either of the alimentary tract, or other organs, or constitutional in type, and (3) the introduction into the system of toxic substances such as lead,

mercury, etc. Hyperacidity, anacidity, hypersecretion, chronic dyspepsia, etc., so far have been able to be interpreted as symptoms of some underlying cause. Until the basic cause has been definitely established the use of drugs and diets has certain evils. They may alleviate, even in organic disease, the gastrointestinal symptoms. The assumption is then prone to be made that the case is purely functional in nature and further investigation into its cause is neglected. As a result, some organic diseased condition may be overlooked. The following case strikingly illustrates this point:

CASE 7. M. J. S., white, male, aged 50. O.D.D. No. 46279. Diagnosis: Carcinoma of the stomach. The past medical history was essentially negative. He had lost six pounds in the four months before admission to the Out-Door Department. One year prior to his admission to the Out-Door Department he had had hematemesis. Following this he received medical treatment for gastric ulcer and apparently made a good recovery. About every two months since then he had had slight dyspeptic symptoms lasting for periods of a week. The symptoms consisted of some epigastric distress and belching, appearing after food and lasting for an hour. The last attack began ten days before admission to this clinic. The usual symptoms were present except that the epigastric distress was worse. He complained that he seemed to be losing strength. On physical examination the patient appeared very sallow. Otherwise the examination was essentially negative.

Röntgen report. No. 11607. The stomach was atonic, normal in position, and freely movable. Peristalsis was sluggish. There was a trace of the barium meal given six hours previous to the examination. As the barium entered the stomach through the cardiac orifice it was seen to take an irregular course. There was a constant, mottled irregularity in the outline of the cardia and lesser curvature in that vicinity. The sphincter and the duodenum were normal. The ileum contained a residue six hours after feeding barium. At this time the barium column had reached the cecum. In twenty-four hours it was in the rectum.

Examination of the urine was negative. The blood showed 75% hemoglobin and 5,500,000 red cells per cubic millimeter. No free HCl was present in the gastric contents removed

after a test breakfast. The total acidity was 10. There was no lactic acid or Oppler-Boas bacilli. The Wassermann reaction in the blood serum was negative.

The patient whose case has just been described was a chef. He ate at frequent and irregular intervals. His meal hours were regulated and he was given a diet of milk, eggs, toast, cereals, and scraped beef. Within a few days he became free from all symptoms. After two weeks he had gained a pound in weight. At this time radiographic studies were made. The complete abatement of all symptoms had led to the opinion that they had been due to the patient's habits of eating. Subsequent studies have demonstrated that he can remain symptom free only on a limited diet. Errors in diagnosis similar to the one occurring in this case may arise in ulcer cases, especially after an operation for gastric or duodenal ulcer. Not infrequently special dieting with or without antacids relieves the symptoms, their ultimate cause is not considered an important matter, and the physician is led to overlook what may be the first signs of the return of the former trouble. For this reason if such a patient cannot eat a wholesome general diet the reason should be ascertained. This discussion is not to be construed as meaning that certain drugs and methods of special dieting are never of value. But it is for the purpose of emphasizing the fact (1) that symptoms valuable for diagnostic purposes may be masked by the too early use of these therapeutic measures, and (2) that an attempt should always be made definitely to establish the underlying cause for gastric symptoms.

SUMMARY.

By means of illustrative cases an attempt has been made to emphasize (1) the value of the fluoroscope in the diagnosis of some of the gastrointestinal disorders, (2) the clinical significance of certain abnormal muscular phenomena of the alimentary tract, (3) the necessity for the clinician to learn the radiography of his chosen field, and (4) the possibility of masking important symptoms by the too early use of special dietary measures.

DISCUSSION.

DR. JOSEPH H. PRATT, Boston: In his consideration of diagnostic methods to be applied in gastrointestinal diseases, Dr. McClure has

done well to emphasize the importance of the fluoroscopic examination and of dietary measures. The radiological examination is too often limited to the study of plates, and the importance of diet in diagnosis is not generally recognized. I wish that the reader had also called attention to the importance of a complete history in the differentiation of the neuroses from organic diseases of the stomach and intestines. My personal observations incline me strongly to the view that the majority of patients who complain of indigestion are suffering from the gastric or intestinal manifestations of neurasthenia or hysteria.

There is a tendency on the part of many physicians to deny the existence of neurasthenia and to regard this diagnosis as nothing more than a confession of an inability to ascertain the true nature of the trouble. To all who hold that neurasthenic symptoms are to be regarded as an expression of intestinal auto-intoxication, chronic appendicitis, eye-strain, displacement of the viscera, or other somatic diseases, the masterly work of Dejerine on the psychoneuroses can be recommended. Neurasthenia, as Osler says, is a disease above all others which has to be diagnosed from the subjective statements of the patient, rather than from the physical examination.

As an aid in diagnosis of the gastric and intestinal forms a full history of the emotional shocks and strains is of the greatest value. A good anamnesis may take much time but it may make the diagnosis clear and save the patient from a long course of medical treatment or a surgical operation.

The diagnosis is often difficult. Many cases of neurasthenia with stomach and intestinal symptoms as their chief or only definite manifestations are mistaken for a variety of organic diseases, and it must be admitted, on the other hand, that various lesions of the abdominal organs are sometimes wrongly diagnosed as neurasthenia in origin.

The study of neurasthenia has been left chiefly to neurologists, but the great majority of the patients with gastric and intestinal symptoms naturally go to gastro-intestinal specialists rather than to neurologists. Dercum of Philadelphia states in a recent paper that he rarely has a patient with hysteria admitted to his wards whose abdomen does not bear the scar of one or more operations. I am sure that our Boston surgeons, as a whole, realize the care that should be taken in ruling out neuroses before operating, and many recognize the great frequency of neurasthenia and hysteria among the patients who seek relief by operation for abdominal symptoms.

The chief factor in the etiology of a severe gastrointestinal neurosis may be, as Dejerine says, injudicious remarks of a physician or a faulty diagnosis of organic diseases. Recently I saw a striking illustration of this. A man of

48 who had never been troubled with indigestion had a severe cold with trivial discomfort in the epigastrium for a few days' duration. He was nervously tired at the time as a result of his mother's long and distressing illness. The attending physician on his second visit told him that he had a gastric ulcer and that an operation was necessary. The patient was greatly disturbed by this diagnosis as a neighbor with gastric ulcer had suffered much and had undergone two operations with little relief. From that time, for a period of over two years, the patient had almost constantly a dull pain in the upper abdomen, so disturbing as to interfere with his sleep. He had several radiographic examinations and consulted a number of physicians, but no evidence of ulcer was found. Suspecting the pain was due to gall stones, I advised an operation which showed that the stomach, gall bladder and intestines were normal. After the operation the pain ceased. The lesson taught by this case was firmly impressed upon me, as I had mistaken a neurosis for an organic disease. Furthermore, I did not obtain the history of the emotional shock until after the operation. The patient had denied that he worried or that he was troubled by fears or had had any cause for mental agitation. His wife, however, told me that from the day the doctor told him he had a gastric ulcer his attention was focussed on his stomach. His preoccupation was only too evident to his family. The idea was so firmly fixed, that reassurance from a number of physicians he consulted was without avail. If I, or any one of his earlier physicians, had obtained a full history of his case a diagnosis could have been made with a reasonable degree of certainty, and by explaining to him the cause and nature of his trouble, he could probably have been cured without an exploratory operation.

DR. W. C. QUINSBY, Brookline: I am sure that all surgeons should appreciate very highly the splendid signs of the times which Dr. McClure's work and paper illustrate; for we see here an internist holding a very broad viewpoint in regard to diseases of this special part of the anatomy and taking it on such a sound basis as that of anatomy and anatomical physiology, using an accurate method such as the fluoroscope to see the pathology of the living. Such methods of thorough study of our cases pointed out by Dr. McClure are those which are going to give the largest number of correct diagnoses, and be followed by the largest number of instances of proper curative treatment.

Furthermore, I think the point which he has brought out, in closing, in regard to clouding some of the symptoms in such cases as these, by instituting medical treatment and dietary treatment before having made a proper diagnosis, is an exceedingly important point.

There is no doubt whatever that the continua-

tion of work such as this will mean definite advance in the treatment of lesions of the stomach and intestines.

DR. J. B. BLAKE, Boston: I regret to say that I did not hear all of Dr. McClure's paper, but I did hear him say one thing of great importance—that if a man cannot take the diet that he ought to be able to digest at his age and in his particular line of occupation, there is something wrong with him. I think that is an extremely important general lesson for everybody to remember. It is the sort of simple conclusion which should come out of research, and investigation and study of the newer and more complicated methods of diagnosis. Assuming it to be a fact, it is somewhat parallel to the observations of McKenzie on the heart, *viz.*, that all the laboratory methods of testing the power of the heart are no better than the clinical findings, if the clinical findings are carefully carried out. I feel certain that Dr. McClure is entirely right. A man who is healthy ought to be able to eat and digest properly an average diet. If he cannot do that he has either got a definite organic disease or one of the other conditions which Dr. McClure mentioned.



Book Reviews.

Neoplastic Diseases. By JAMES EWING, A.M., M.D., Sc.D. Philadelphia and London: W. B. Saunders Company. 1919.

The author of this volume, "Neoplastic Diseases," by presenting tumors as specific diseases, represents a departure from the prevailing method of dealing with tumors. Until recently, tumors have been treated in a general way without any particular regard for the organ affected or the causative agent involved. The author of this book, however, believes that this attitude is detrimental to further enlightenment on the knowledge of tumors and endeavors in this volume to "analyze the numerous etiologic factors which meet in such diverse fashions in the inception of tumors, to emphasize the general dependence of clinical course upon histologic structure, to trace the histogenesis to the last degree, impressing its essential importance when known, and to enumerate and contrast the more striking clinical features which are often highly characteristic of different tumors."

The first part of the book deals with general oncology. A brief survey of historical theories shows the progress which has been made up to the present time and prophesies a period of specific etiological investigation in the future. The classification and general pathology of tumors, their malignancy and its effect upon the organism are considered. Theories of the na-

ture of cancer, including the embryonal theory, the theory of cell autonomy, heredity, and the parasitic theory are discussed. In the field of experimental cancer research, the author considers various attempts which have been made to produce and transplant tumors experimentally. The second part of the book presents the origin, structure, and natural history of tumors, and considers fibromas, sarcomas, and cancers and other neoplastic diseases with reference to the organs involved. The text is illustrated throughout by several hundred photographs. By making more accessible the knowledge of tumors, this book is rendering a worthy contribution to the reduction of the mortality from cancer.

The Blind. By HARRY BEST. New York: The Macmillan Company, 1919.

The condition of the blind, narrated in many accounts of their struggles, fortitude, misfortunes, and attainments, has often been commented upon. Yet is it not too often viewed from a sentimental viewpoint rather than as a matter of scientific inquiry conducted for the purpose of solving the problems which these unfortunate individuals present? The author of *The Blind* has attempted to report the actual position of the blind in society and the work which is being done for them at the present time in the United States. He believes that provision for the blind has not been adequate in this country. It is true that schools have been established for the education of blind children; yet measures so that the adult blind may be equipped to meet the world in spite of their handicap have not yet been adopted. At the present time, partly due, perhaps, to the additional incentive of caring for men blinded by the war, interest in this problem is obviously growing. Aside from the preparation of reading matter and intellectual activity, small industrial establishments are now being organized and the matter of employment for the blind is receiving greater attention. In this volume, all these aspects of the problem,—the general condition of the blind, their education, their economic status, and the work of organizations interested in assisting the blind,—are presented in an unusually interesting way.

Yet, it is on no one of these aspects, but rather on the preventive activities, that the author of this book lays particular emphasis. The possibilities of the prevention of blindness are of primary concern to the individuals themselves, to physicians, and to the community. Examination of the causes of blindness, the effects of heredity, the extent to which certain diseases causing blindness may be arrested, and measures which may be adopted to prevent blindness due to accidents and injuries,—it is this phase of the problem which the author believes should be the main source of assistance and the chief concern of the people of America.

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INSECT TRANSMISSION OR CAUSATION OF DISEASE.

In an interesting article in *Science*, W. Dwight Pierce emphasizes the importance of locating the possible intermediate hosts and invertebrate carriers in studying the causation of disease. In order to stimulate research on this subject, he has outlined some of the steps which he considers necessary in successful investigation. He mentions as one of the primary requisites in a thorough investigation of disease transmission, co-operation between one or more physicians and diagnosticians, parasitologists, and entomologists, each phase being investigated by some member of the group. More satisfactory results and a greater amount of credence can be attained by the co-operation of a group than by the efforts of a single investigator.

There are two distinct methods of attempting to solve the problem of insect transmission. The

first is to work from the unknown disease and to learn by experimentation what species of insects might be concerned in its transmission. By the second method one might study all the insects involved in disease transmission and obtain by cultures and microscopic studies a knowledge of the parasitic organisms normally and occasionally found in these insects. It is probable that the first type of investigation would originate from public necessity and would be carried on by physicians and parasitologists, or by the suggestion of entomologists. The second line of investigations would originate as problems assigned by a professor or head of a laboratory to students:

The author has stated that insects may be involved in disease transmission either by transmission of an organism or the inoculation of a toxin; or there may be an intermediate phase in the life cycle of an organism, but not come directly in contact with the final host. Insects can carry bacteria, many types of protozoa, and many species of parasitic worms. Insect toxins may be introduced into the system by means of the mouth, claw, caudal appendage, or ovipositor of the insect. Some insects live as parasites on the bodies of men and animals; sometimes insect larvae are ingested as food, and continue to develop in the intestines or other organs, often at the expense of the tissues. Insects may obtain the organisms which cause disease directly from the blood of an infected host, from infected surfaces of the body, or from the excretions of an infected host. The organism may then be transmitted by the insect by direct inoculation through the proboscis or by the passive transmission of the parasite in the reflex actions which take place in the sucking of blood; the organism may be regurgitated by the insect on the body of its host and obtain entrance by its own activity, or it may pass through the insect and out in its feces, or in malpighian excretions. If the organism is taken up by the insect in its larval stage it may pass through a number of insects before finding a vertebrate host.

It is essential that workers be able to recognize the disease which they are studying. They should know its history and distribution, whether it occurs in pandemic, epidemic, endemic, or sporadic form, its relation to the physical, biological, or climatic features of the countries where it occurs, whether immunity or difference of susceptibility has been recognized,

its symptoms, theories of causation and dissemination, and suggested treatment.

Certain insects should be investigated with especial care, particularly insects which come in contact with the blood of the patient, or the food or feces. Before transmission experiments are begun, it is necessary to know the normal conditions of life of the insect, its food, methods of reproduction, and the proper conditions of the soil or water in which it is to be. The study of the causation of disease is receiving considerable attention today; it is to be hoped that the suggestions offered in this article may lead to greater effort in locating the possible intermediate hosts and invertebrate carriers.

THE ROCKEFELLER FOUNDATION IN CHINA.

A SURVEY of the medical work being organized in the Far East is being made by Dr. George E. Vincent, president of the Rockefeller Foundation of New York. He has visited North China, particularly the new buildings of the Pekin Union Hospital, which are now being constructed. He has visited also the Union Medical College at Tsianfu, and other mission hospitals in the north, for the purpose of bringing about a closer coöperation in equipment, training of the staff, and the supporting of these institutions. Dr. Vincent has discussed with representative missionary doctors from every province the aspects of medical work in China. Mission doctors will be invited by the Foundation to attend the Pekin institution for annual periods of study and research, a plan which will greatly encourage research on special diseases, to which it has hitherto been difficult for individual doctors to devote themselves.

The construction of the Pekin Medical College has been somewhat delayed because of difficulties in securing materials from the United States; but it is probable that the three main buildings will be opened for college work this fall and that the entire institution will be completed in September, 1920. It will be the most completely equipped institution for medical research and teaching in China. Clinical and research laboratories, the anatomical, chemical, and physiological departments, and laboratories for x-ray and for pathological and bacteriological investigations are unusually complete and are of the most modern type.

In addition to the development of medical science in Pekin, the Foundation, during 1918, assisted the work of nineteen hospitals and two medical schools in north, east, and central China. Special medical study in America was made possible for thirty-five medical missionaries and thirty Chinese physicians and nurses. Dr. Vincent has expressed his belief that medical progress in North China has given evidence of the correctness of the Foundation's policy of training the young Chinese student so that he may ultimately be able to become responsible for the health administration in his own country.

PSYCHICAL RESEARCH IN DELINQUENCY.

THE various problems which are encountered in dealing with psychopathic delinquents, discussed by Dr. Katherine Bement Davis at a recent session of the American Institute of Criminal Law and Criminology, indicate the importance of more thorough psychical research in dealing with people of this sort. Dr. Davis has commented upon the attitude of our institutions, and has offered several valuable suggestions for overcoming difficulties which exist under the present system. In many institutions, women and girls who are given good care and proper discipline complain of being ill treated. Dr. Davis believes that there are three factors which lead to this situation: First, the lack of scientific training in dealing with cases of genuine mental disturbance among those in charge of our women's institutions; second, the lack of equipment and a properly trained staff for handling these cases; and third, perhaps the most important cause of disturbance, the fact that in these institutions are gathered together all kinds of women, the only thing which they have in common being the violation of the law.

Dr. Davis points out that feeble-minded persons who need permanent custodial care are often not desirable inmates of an institution whose purpose is to make it possible for delinquent women to return to society. It is difficult to take care of women of pronounced psychopathic tendencies in the midst of a group who must be treated as normal persons if the institution is to accomplish its reformatory purposes.

Attempts have been made for the last ten years to secure proper treatment for the feeble-minded in the State institutions and to have removed from ordinary reformatory institutions feeble-minded delinquents. Persons who can never become self-supporting members of society should not be harbored in penal institutions whose primary aim is education. Dr. Davis points out that the courts can help to overcome this difficulty by establishing clinics for examination into the mental condition of delinquents in connection with judicial procedure.

MEDICAL NOTES.

GOVERNMENT WANTS WORKERS IN VENEREAL DISEASE CAMPAIGN.—The recently created Interdepartmental Social Hygiene Board of the United States Government is in need of a number of specially trained men and women to complete its organization. The United States Civil Service Commission has announced examinations for the following positions: Chief of division for scientific research, \$3,500 to \$4,500 a year; chief of division for educational research and development, \$3,500 to \$4,500 a year; educational assistant, \$2,800 to \$3,600 a year; chief of division of relations with states, \$3,500 to \$4,500 a year; chief of division of records, information and planning, \$3,500 to \$4,500 a year; supervising assistant and inspector, \$2,800 to \$3,600 a year; field agent, \$1,800 to \$3,000 a year. All positions are open to both men and women.

Applicants for these positions will not be given scholastic tests in an examination room but will be rated upon their education, experience, and writings. Published writings of which the applicant is the author will be submitted with the application. For most of the positions a thesis on one of a number of given subjects will be accepted in lieu of published writings. The receipt of applications will close on November 4. Detailed information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or from the Secretary of the United States Civil Service Board at the post office or customhouse in any of 3,000 cities.

The law creating the Interdepartmental Social Hygiene Board provides for a co-operation of the War and Navy Departments and the

Public Health Service of the Treasury Department for the prevention, control, and treatment of venereal diseases. The duties of the Board as set forth in the act are (1) to recommend rules and regulations for the expenditure of moneys allotted to states for the use of their respective boards or departments of health in the prevention, control, and treatment of venereal diseases; (2) to select universities, colleges, or other suitable institutions which shall receive allotments for scientific research for the purpose of discovering more effective medical measures for the prevention and treatment of venereal diseases; (3) to recommend such general measures as will promote correlation and efficiency in carrying out the purposes of the act; and (4) to direct the expenditure of certain moneys appropriated by the act.

GERMAN PHYSICIANS IN RUSSIAN ARMY.—A recent report has stated that the medical journals in Germany are publishing advertisements offering positions to German physicians and surgeons in the Russian Army. The right of securing homesteads is promised them. It has also been reported that medical men are being urged to enlist with the volunteer troops units organized for fighting bolshevism and are promised a premium of five thousand marks if the counter revolution is successful.

INTERNATIONAL CONFERENCE OF WOMEN PHYSICIANS.—An international conference and a national convention of women physicians will be held in New York City from the fifteenth of September to the twenty-fifth of October, 1919. Questions of physical, social, and moral health will be discussed by women physicians and psychologists from Scotland, England, Norway, Sweden, Denmark, France, Italy, Switzerland, Belgium, China, Japan, India, South America, Canada, and the United States. Addresses will be given on many subjects, including health and personality, exercise, clothing in relation to health, beauty, and practicability, national food economics, feminine handicaps, the value of work in the development of the child, industrial health, bacteria, health education, and emotional reactions to present social conditions and their effect on health. A series of meetings from October 17 to October 25 will be attended by invited non-medical men and women.

RED CROSS NURSES IN THE WAR.—The *Red Cross Bulletin* has stated that nineteen thou-

sand, eight hundred and twenty-seven Red Cross nurses have been in active duty with the Army and Navy Nurse Corps and the Red Cross, in this and foreign countries. One hundred of these nurses have died in the service.

AMERICAN PUBLIC HEALTH ASSOCIATION.—The American Public Health Association will hold its next annual meeting at New Orleans, La., October 27-30, inclusive. Southern health problems, including malaria, typhoid fever, and hookworm will be discussed, and a full session will be devoted to influenza for the purpose of developing methods of control. Other questions to be considered include the attitude of legislators toward public health, the obtaining of appropriations, coöperation from women's clubs and health organizations, and the organization of health centers. Public health administration, vital statistics, sanitary engineering, laboratory methods, industrial hygiene, sociology, food and drugs, child hygiene, and personal hygiene will be discussed at the various sessions. The program of the meetings will be published in the *American Journal of Public Health* issued on October 5.

DEPARTMENT OF HEALTH IN CANADA.—There has been passed recently in Canada a bill creating a federal department of health for the Dominion. It provides for the establishment of a department of health, for a minister of health, a deputy minister, and an advisory council.

MEDICAL DEPARTMENT OF THE UNIVERSITY AT MEMPHIS.—The following interesting account of a possible case of "shell shock" at the battle of Marathon, 490 B.C., described by Herodotus (Book VI, section 117) has appeared in a recent issue of *Science*:

The following prodigy occurred there: An Athenian, Epizelus, son of Caphagoras, while fighting in the medley, and behaving valiantly, was deprived of sight, though wounded in no part of his body, nor struck from a distance; and he continued to be blind from that time for the remainder of his life. I have heard that he used to give the following account of his loss. He thought that a very large heavily-armed man stood before him, whose beard shaded the whole of his shield: that this specter passed by him, and killed the man that stood by his side. Such is the account I have been informed Epizelus used to give.

Probably this is the first historical record of "shell shock."

APPOINTMENT OF DR. A. R. DOCHEZ.—Dr. Alphonse Raymond Dochez has been appointed associate professor of medicine at the Johns Hopkins University.

ANDREW CARNEGIE.—A recent issue of *The British Medical Journal* has commented upon the beneficent gifts of Andrew Carnegie and his influence on the progress of medicine in the United Kingdom. His gift of ten million dollars to the Scottish universities for the payment of fees, the encouragement of scientific research, and the furnishings of endowments for new lectureships and chairs and laboratories has benefited the departments of medicine. Through the Carnegie United Kingdom Trust, Mr. Carnegie has aided the prevention of disease among expectant mothers and young children. Mr. Carnegie's gift of \$100,000 to King Edward's Hospital Fund is still another example of his interest in the progress of medical science.

ROCKEFELLER HOSPITAL AND MEDICAL SCHOOLS IN PEKING.—Work on the construction of the new Rockefeller Hospital and Medical Schools in Peking is progressing satisfactorily. The corner stone was laid on September 24, 1917, by Mr. Fan Yuanlien, Chinese Minister of Education. The site covers an area of ten acres. It has been found possible to use Chinese materials almost exclusively by an adaptation of Chinese architecture, which harmonizes in design with the monuments in Peking. The courtyards, gateways, and walks have been treated in a Chinese way, and many fine trees and a Chinese rock garden add greatly to the beauty of the buildings.

DRUG ADDICTION.—In a recent number of the *American Journal of Public Health*, Ernest S. Bishop, M.D., has discussed the subject of drug addiction. He believes that this is a disease, and should be studied and treated from a scientific, rather than from a social and legal point of view. Drug addiction is recognized as a problem involving nearly as many persons as tuberculosis, people who should not be regarded purely as mental degenerates. Dr. Bishop thinks it probable that drug addiction exists in mentally, morally, and physically normal individuals as well as among the lower classes.

with whom it is generally associated, and that it may best be explained by the presence of some substance developed and circulating in the blood. In order to deal more adequately with the drug situation, the author recommends organized scientific, medical, or public health activity directed towards the clinical and laboratory investigation of this disease.

FRENCH AND AMERICAN PHYSICIANS.—It has been announced in *Le Temps* that an organization has been formed for the purpose of establishing permanent relations between American and French physicians and surgeons. Commissions have been appointed to take charge of the establishment of a course of teaching for American physicians visiting France, to found a bureau of information, and to examine into means of organizing an exchange of articles on medical and surgical subjects between the journals of the United States and France.

FUTURE RED CROSS ACTIVITIES.—The American Red Cross has announced that the third roll call will be held from November 2 to 11, when the American people will be asked to renew their membership for 1920 and contribute \$15,000,000 for the future work of the organization.

Foremost among the activities during the coming year will be nation-wide activity for the promotion of public health; a vigorous campaign for the extension of the country's nursing resources; the broadening of Red Cross home service; increased junior Red Cross activities; extension of Red Cross facilities for emergency disaster relief; completion of relief measures for the sufferers from the war in this country and overseas, and preparation to fulfill whatever duties may be laid upon it as the official volunteer relief society authorized to assist the Army and Navy.

The announcement has emphasized the importance of public health nursing. Red Cross public health nurses will be assigned to as many small communities as possible. The following statement outlines the work which will be undertaken by the Red Cross in addition to public health activities:

"The Red Cross must hold itself ready for instant relief service in time of public disaster, such as great fires, floods, cyclones, shipwrecks, earthquakes, pestilence, famine, and epidemics.

"The turning over to the American Red Cross of the surplus medical and surgical sup-

plies and supplementary food stores of the American Army abroad for distribution among the still suffering native populations, together with the foreign relief programs still being carried out largely in Poland, the Balkans, and Siberia, necessitates the continuance of Red Cross operations overseas.

"Until demobilization is completed, and after, the Red Cross military relief organization will continue to function. Thirty thousand service men still in the military hospitals, many crippled for life, require Red Cross attention. Hospital, canteen, and motor service must continue.

"Completion of Red Cross work for the soldiers disabled in the fighting and general assistance to the fighting men in getting back to civil life is still far off, particularly in the many and varied phases of home service. Thousands of families of service men are still being helped to solve their own problems by this Red Cross activity, and money relief in this connection alone is in excess of \$500,000 a month."

FRENCH DECORATION FOR DR. WILLIAM PALMER LUCAS.—Dr. William Palmer Lucas, Professor of Children's Diseases at the University of California Hospital, chief of all the work of the University for children, has received the notification from Monsieur André Tardieu, French Minister in charge of his government's American affairs, that the French government has conferred upon Dr. Lucas the order of Chevalier de la Legion d'Honneur, with the gratifying comment that the French people with whom Dr. Lucas had worked for the children of France had asked that he be decorated. At the same time Dr. Lucas was notified that the Minister of the Interior had conferred upon him France's highest medical decoration, "La Medaille de Vermeil des Epidemies," for services rendered to children of France.

BOSTON AND MASSACHUSETTS.

NEW HOSPITAL AT NEWBURYPORT.—The Julia M. Moseley ward of the Anna Jaques Hospital was opened for the care of tubercular patients on August 21. This building is separate from the main institution and was erected at the cost of \$40,000. It will accommodate sixteen patients.

FRANKLIN DISTRICT MEDICAL SOCIETY.—A meeting of the Franklin District Medical Society was held at the Mansion House, Greenfield, Tuesday, September 9. Dr. Herbert B.

Perry of Northampton, ex-Lieutenant-Colonel in the American Expeditionary Forces, spoke on "Empyema."

PROPOSED COMPENSATION LAW.—At a recent session of the National Conference of Commissioners on State Laws, held in Boston, a proposed law to provide compensation for disability and death from disease contracted as a result of occupation was discussed. The effort to draft this act is in response to a growing demand for legislation arising from conditions prevalent in certain classes of employment where lead, mercury, phosphorus and arsenic or carbon bisulphide, nitrous fumes, African boxwood, chromic acid, bichromate of ammonium, potassium, sodium, tar, pitch, bitumen, mineral oil, paraffine, and compressed air are utilized in a commercial process.

The discussion indicated that there was a difference of opinion as to whether or not the law should include a schedule showing what diseases should be included within its scope, or whether it should contain a general provision under which the merits of each case should be left to the determination of the commission or the jury. The law as framed by the committee contained a schedule of 26 compensable diseases.

To be entitled to compensation for disability arising from such occupational diseases, it must have been due to the nature of the employment within the 12 months immediately preceding the date of disablement. Suitable physicians designated by the State Board of Health certify whether the disease is due to the nature of the employment. Provisions were made in the proposed law for future changes in the schedule of diseases.

It was finally voted, after considerable discussion, not to specify the occupational diseases for which workmen could receive compensation.

GIFT TO MALDEN HOSPITAL.—By the will of the late William B. Buckminster of Malden, one thousand dollars has been bequeathed to the Malden Hospital.

WEEK'S DEATH RATE IN BOSTON.—During the week ending August 30, 1919, the number of deaths reported was 143 against 192 last year, with a rate of 9.36 against 12.76 last year. There were 29 deaths under one year of age against 45 last year.

The number of cases of principal reportable diseases were: Diphtheria, 32; scarlet fever,

22; measles, 4; whooping cough, 17; typhoid fever, 5; tuberculosis, 43.

Included in the above were the following cases of non-residents: Diphtheria, 4; scarlet fever, 4; tuberculosis, 9.

Total deaths from these diseases were: Diphtheria, 2; scarlet fever, 2; typhoid fever, 2; tuberculosis, 16.

Included in the above were the following non-residents: Diphtheria, 1; scarlet fever, 1; typhoid fever, 1; tuberculosis, 1.

During the week ending September 6, the number of deaths reported was 183 against 179 last year, with a rate of 11.98 against 11.90 last year. There were 35 deaths under one year of age against 27 last year.

The number of cases of principal reportable diseases were: Diphtheria, 25; scarlet fever, 17; measles, 7; whooping cough, 4; typhoid fever, 4; tuberculosis, 31.

Included in the above were the following cases of non-residents: Diphtheria, 1; scarlet fever, 6; tuberculosis, 4.

Total deaths from these diseases were: Diphtheria, 3; whooping cough, 1; tuberculosis, 22.

Included in the above were the following non-residents: Tuberculosis, 1.

Influenza cases, 7.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY.—The following minimum fee table was adopted by vote of the Society, April 16, 1919: Ordinary visits, between 7 A.M. and 6 P.M., \$3.00; evening visits, between 6 P.M. and 9 P.M., \$4.00; night visits, between 9 P.M. and 7 A.M., \$5.00. Whenever more than one person is attended at a single visit, an extra charge, as for an office visit, shall be made for each person after the first. Office visits in *office hours*, \$2.00; advice by telephone, the same as office visits; vaccination, \$2.00; Necessary after-care shall be charged at regular fee. For a certificate of sickness, or health, or insurance, or a letter of advice, \$2.00; laboratory examinations, \$2.00; confinement, \$25.00; simple fracture or dislocation, \$15.00. An additional charge may be made for attendance upon cases of contagious disease or when extra time is spent, by travel, consultation or detention. Such deductions shall be made herefrom as charity may require.

HAMPDEN DISTRICT MEDICAL SOCIETY.—The annual clambake of the Society was held at Riverside Park, Agawam, Mass., on Tuesday, September 9, 1919, at 3.30 P.M. There were baseball games, tug of war, relay races and dashes.

The Massachusetts Medical Society.

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WORCESTER NORTH.—W. F. Robie, Baldwinville, President; C. E. Woods, Lunenburg, Vice-President; C. H. Jennings, Fitchburg, Secretary; F. H. Thompson, Jr., Fitchburg, Treasurer; L. F. Baker, Fitchburg, Librarian.

MEETING OF THE COUNCIL.

A stated meeting of the Council will be held in John Ware Hall, Boston Medical Library, 8 The Fenway, Wednesday, October 1, 1919, at 12 o'clock, noon.

Business:

- Report of Standing Committees.
- Report of Delegates to House of Delegates, American Medical Association.
- Reports of Committees appointed to consider petitions for reinstatement.
- Petitions for reinstatement.
- Appointment of Auditing Committee.
- Appointment of Delegates to the meetings of the Conferences on Medical Education and Medical Legislation of the American Medical Association in Chicago, February, 1920.
- Appointment of Delegates to the annual meeting of the Vermont State Medical Society at Burlington, October 9 and 10.
- Incidental business.

WALTER L. BURRAGE, Secretary.

Boston, September 24, 1919.

NEWS FROM THE DISTRICT MEDICAL SOCIETIES.

The following note has been sent to the Councilors by the Editor for the Society:

Dear Doctor:

For the purpose of procuring more medical news from the eighteen District Medical Societies for the official organ of the Society, the BOSTON MEDICAL AND SURGICAL JOURNAL, will you be good enough to send me any items of news from your district, of which you have knowledge. I now live near at hand to the printing office where the JOURNAL is published weekly, and am in constant touch in the editing of the publications of the Society, so that matter sent me can be given to the printer promptly, and I am assured that it will be published as soon as space and makeup permit.

We want announcements that Fellows have returned from military or naval service and where they are to be found; notices of appointments to office, to hospital staffs, to medical examinerships or to military or civil positions; as to the hospital or nursing situation in your community; also marriages and deaths. It has been the aim of the editor to publish in the JOURNAL a suitable notice of the death of every Fellow who passes on. Data from the friends of those who knew the departed will help to make the notices fuller and better. Announcements of the coming meetings of the District Societies should be sent in early, at least two weeks before a given meeting. Abstracts of the proceedings will be welcome.

Faithfully yours,

WALTER L. BURRAGE,
Editor for the Society.

42 Eliot Street, Jamaica Plain,
September 24, 1919.
Telephone, Jamaica 469.

Miscellany.

NOTICES.

THE ANNIVERSARY VOLUMES OF SIR WILLIAM OSLER.—The anniversary volumes published in honor of Sir William Osler's seventieth birthday will be ready for delivery by October first. Subscriptions are still being accepted and may be sent to the treasurer of the committee, Dr. Henry Barton Jacobs, 11 Mt. Vernon Place, Baltimore, Md.

ALVARENGA PRIZE OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.—The College of Physicians of Philadelphia announces that the next award of the Alvar-

enga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about two hundred and fifty dollars, will be made on July 14, 1920, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

Essays intended for competition may be upon any subject in medicine, but cannot have been published. They must be typewritten, and if written in a language other than English should be accompanied by an English translation, and must be received by the Secretary of the College on or before May 1, 1920.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope on its outside the motto of the paper and within the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award.

No Alvarenga Prize for 1919 was awarded.

FRANCIS R. PAICKARD, *Secretary.*

19 South 22d Street
Philadelphia, Pa.

STATE DEPARTMENT OF HEALTH.—The examination for the position of State District Health Officer and Epidemiologist for the Sub-division of Venereal Disease, originally set for July, but postponed, will be held on September 29 and 30, at 9 A.M., at the Civil Service Examination Room No. 15, State House, Boston.

B. W. CAREY, *Director.*
Division of Communicable Diseases.

SOCIETY NOTICES.

CONFERENCE ON MENTAL HYGIENE.—A meeting, under the auspices of the Massachusetts Society for Mental Hygiene, will be held at Municipal Hall, Pittsfield, Mass., Monday, September 29, at 4 P.M. Speakers: Frankwood E. Williams, M.D., William H. Burnham, Ph.D., John A. Houston, M.D., and A. W. Stearns, M.D.

NEW YORK AND NEW ENGLAND ASSOCIATION OF RAILWAY SURGEONS.—The twenty-eighth annual session of the New York and New England Association of Railway Surgeons will be held at the Hotel McAlpin, New York City, on Monday, October 20, 1919. A very interesting and attractive program has been arranged. A symposium on "The Modern Treatment of Infected Wounds" will be presented by leading surgeons. Railway surgeons, attorneys, and officials and all members of the medical profession are cordially invited to attend.

DR. J. S. HILL, *Pres.*,
Bellows Falls, Vt.
DR. GEORGE CHAFFEE, *Cor. Sec.*,
Binghampton, N. Y.

MARRIAGE.

DR. WILLIAM H. MCBAIN married Miss May V. Powell on September 3, in the Sacred Heart Church of Malden. Dr. McBain is a graduate of Harvard Medical School and is assistant medical examiner and bacteriologist in Malden and has charge of the Contagious Hospital.

RECENT DEATHS.

DR. JOSEPH A. KENEFICK died at the Lawrence Hospital on September 10. Dr. Kenefick was an ear and eye specialist and practised in New York City.